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Educational News and Editorial Comment

CELEBRATION OF THE FORMAL OPENING OF THE GRADUATE EDUCATION BUILDING OF THE UNIVERSITY OF CHICAGO

On March 14 and 15 the University of Chicago celebrated the formal opening of its Graduate Education Building. This building was erected with a portion of a fund of $1,500,000 given to the University of Chicago by the General Education Board for the promotion of the scientific study of education. The gift came in part as a recognition of the work which the Department of Education has already done in carrying forward and stimulating such study. It came, too, as an expression of confidence in the value of the scientific study of education and as such cannot fail to have nation-wide significance. In a paper read at one of the conferences held during the two-day celebration of the formal opening of the building, Chancellor Capen of the University of Buffalo spoke as follows concerning the significance of the occasion.

To some of us this celebration has a dual significance. It crowns with a visible symbol a life-long service to educational science of unparalleled resourcefulness, integrity, and courage. It recognizes an influence exercised nation wide in conformity with the finest traditions of our craft. But it is also an augury. It foreshadows a just appreciation by universities generally of the scientific study of education as a university enterprise. It is altogether appropriate that that ap-

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preciation should be signalized here and by means of this magnificent new establishment. The university world is by long habit accustomed to look to the University of Chicago for realistic appraisal of each new educational situation as it arises, for bold exploration and experiment, and for equally bold defiance of tradition whenever tradition is proved to be outworn.

The opening of the new building will no doubt mark the beginning of a new period in the history of the Department of Education. The Department will now be housed in a model building adequately equipped with the laboratory and library facilities necessary for advanced scientific research. The increased facilities and resources of the Department should enable it to attack new problems and to perfect new techniques for their solution.

On the occasion of the opening of the new building a number of educational conferences were conducted in it. Something of the nature of the conferences may be gathered from the following program.

Monday Morning

CONFERENCE OF DOCTORS OF PHILOSOPHY OF THE DEPARTMENT OF EDUCATION ON PRACTICAL APPLICATIONS OF THE SCIENCE OF EDUCATION IN VARIOUS TYPES OF INSTITUTIONS, William Claude Reavis, Professor of Education, *presiding*

"Curriculum Surveys in Higher Education," Lloyd E. Blauch, Executive Secretary of the Survey of the Dental Curriculum, American Association of Dental Schools

"Training for Research in the Light of Field Requirements," Douglas Edgar Scates, Director of the Bureau of School Research, Cincinnati Public Schools

"Measuring the Results of College Instruction," Ralph Winfred Tyler, Professor of Education, Ohio State University

"A University's Program of Research in Elementary Education," James Bartlett Edmonson, Professor of Education; Dean of the School of Education, University of Michigan

"The Application of Scientific Methods to Problems in Higher Education," Homer Price Rainey, President of Bucknell University

Monday Afternoon

CONFERENCE ON TEACHER TRAINING, Donald Slesinger, Professor of Law; Associate Dean of the Division of the Social Sciences, *presiding*

"The Academic and Professional Preparation of Teachers," William Scott Gray, Professor of Education; Director of Teacher Training

"The Experimental Attitude in Teacher Training," Frank E. Baker, President of the State Teachers College, Milwaukee, Wisconsin

"Teacher Training and the Liberal College," Thomas Eliot Benner, Professor of Education; Dean of the College of Education, University of Illinois

Monday Evening

CONFERENCE ON THE SCIENCE OF EDUCATION, Emery Thomas Filbey, Acting Vice-President and Dean of Faculties; Assistant to the President, *presiding*

"The Distribution of Education," Edward Lee Thorndike, Professor of Education; Director of the Division of Educational Psychology of the Institute of Educational Research in Teachers College, Columbia University

"The Laboratory Method in Educational Psychology," Guy Thomas Buswell, Professor of Education; Secretary of the Department of Education

Tuesday Morning

CONFERENCE ON HIGHER EDUCATION, Robert Maynard Hutchins, President of the University, *presiding*

"The Unknowns in Higher Education," Samuel Paul Capen, Chancellor of the University of Buffalo

"The Social Responsibility of the College," Ernest Hatch Wilkins, President of Oberlin College

"Co-ordination of Effort in the Field of Higher Education," George Alan Works, Professor of Education; Dean of Students and University Examiner

At the winter convocation following the conclusion of the educational conferences, the University conferred on Samuel Paul Capen, Chancellor of the University of Buffalo, the honorary degree of Doctor of Laws and on Edward Lee Thorndike, professor of education, Teachers College, Columbia University, the honorary degree of Doctor of Science.

As a part of the celebration the guests of the University were presented with a publication giving an annotated list of Master's theses and Doctors' dissertations of the Department of Education written during the period 1900–1931. The list reveals that the Department has granted 1,156 Masters' and 119 Doctors' degrees. In the Preface of the volume Charles H. Judd, Dean of the School of Education, makes the following comment.

This volume presents summaries of the theses and dissertations which were prepared by those who have received the degrees of Master of Arts and Doctor of Philosophy in the Department of Education of the University of Chicago. It is of interest for two reasons. First, it makes readily accessible to students of the science of education a large body of definite facts brought together through the industry of many workers. Second, it presents in tangible and compact form one outcome of the work carried on for somewhat more than two decades by the Department of Education.

Even a casual inspection of the titles of these theses and dissertations shows the development during recent years of interest in the study of a wide range of

educational problems. Not only so, but the titles reported indicate the evolution of techniques for carrying on the scientific study of such problems.

Special attention is called to the evidence presented in this summary that the Department has, throughout its history, required every candidate for an advanced degree to complete an independent investigation. The custom of awarding the degree of Master of Arts to students who have merely followed the routine of class attendance has unfortunately become too common in American universities. The intellectual power which is cultivated by the preparation of a thesis or dissertation representing independent, constructive work is far greater than that which comes from following a course conducted by an instructor, however inspiring that course may be. The Department of Education believes that the highest grade of academic training is provided only when students are stimulated to undertake independent, individual inquiries.

The volume was prepared and is presented as a part of the celebration held on the occasion of the formal opening of the Graduate Education Building. This building is a gift of the General Education Board. It is devoted to advanced instruction in the field of education and to research and publication in this field. The opening of this building marks the close of one period in the life of the Department of Education and the beginning of a new period. The titles of theses and dissertations prepared by students do not indicate fully the productivity of the Department during the first period, but they show an important part of what has been undertaken and accomplished. They may be looked upon as typical of all the activities of the Department. The array of titles and the fact that the material equipment now placed at the disposal of the Department has been greatly enlarged are justifications for the hope and expectation that the future will witness both an expansion of the number and scope of scientific inquiries in the field of education and an improvement in the techniques employed in these inquiries.

Each thesis or dissertation is sufficiently annotated to enable the reader to gain a general notion of its content. A complete index enables a reader to discover the investigations that have been made in any particular subject. The book may be secured for fifty cents from the University of Chicago Bookstore, School of Education, University of Chicago.

GENERAL POLICIES OF THE DEPARTMENT OF SUPERINTENDENCE OF THE NATIONAL EDUCATION ASSOCIATION

The following resolutions were among those reported by the committee on resolutions and adopted by the Department of Superintendence at its Washington meeting.

C. Because of the interdependence of our social, economic, and educational life we urge that, when feasible, boards of education and administrators co-

operate with other state, county, and municipal officials to the end that, during this period of economic distress, ways may be found to effect economies in governmental administration which will not cripple the education of the children.

D. The welfare of the nation demands that the education of its youth shall not be sacrificed. To this end we call the attention of boards of education and of all legislative bodies, who find themselves confronted with the necessity for economy, to the imperative need for the maintenance of instructional standards. Let economies be made in the material programs of government, but let America not falter in the training of her youth.

E. We urge that increased financial support be given to the Office of Education in order that it may continue to render its valuable services to the schools of this country. We particularly wish to commend the present Commissioner of Education for his keen, active, and intelligent interest as shown by the commissions appointed to conduct research in various phases of public education.

The report of the President's National Advisory Committee on Education has presented to our profession and to laymen an adequate consideration of federal relations to education. Their report is a document which deals with fundamental principles which should govern the relations of the federal government to the several states in the establishment and development of our system of public education. It is a state paper of first importance. It proposes that the control and administration of education be left to the states and that there be established in the federal government a Department of Education with a Secretary of Cabinet rank. We concur in these proposals and recommend the study of their report to the members of our profession and to the lay public.

F. Your committee indorses the resolution relative to citizenship training adopted February 28, 1929, at the meeting of the Department at Cleveland, Ohio.

"Again we remind ourselves that our state systems of education were established in accord with the proposals of Washington, Franklin, Jefferson, and a long line of far-seeing statesmen for the purpose of preserving and improving our political institutions. Again we recall that our wages are paid and our equipment provided by a tax on all the people whether or not they be parents. Thus reminded, we pledge ourselves anew to the direct teaching of the duties of citizenship in all the school grades. Not culture, not scholarship, nor self-support, nor compliance with the entrance requirements of more advanced schools shall turn us from the duty of teaching our youth the needs of our civic life and from inspiring our citizens with a determination to improve it."

We recommend that increased emphasis upon citizenship training be given in all curriculum reorganizations.

G. We believe that true patriotism is not served by ignorance and refusal to face facts and problems. Therefore, the history taught in our public schools should include an intelligent effort to arrive at essential facts involved in the significant crises of the past in order to prepare our people to deal intelligently and justly with such crises in the future. We urge that instruction in history

and other social studies shall present impartially the chief factors and influences operating in domestic and world affairs, and producing problems in peace and war.

Because we believe that only an enlightened public opinion, based on accurate information arrived at after a full and free discussion of facts and issues, can give to our nation real and adequate security, we feel that the dissemination of vital facts with honest discussion of the issues involved is a responsibility of the nation's schools. . . . .

L. At no time in the history of public education has it been more important that the relationship between the public and the schools shall be one of sympathy, co-operation, and understanding. We recommend, therefore, that extraordinary efforts be made to continue courteous, tactful, and considerate public relationships; that administrators gain and keep the confidence of the community through the increased efficiency of the school system, the impartiality of its officials, and the far-sightedness and justness of the policies of boards of education; and that departments of public relations, whether in a system so small that the superintendent is the department or in a city large enough to have its own organization, be established. Such a policy will be a legitimate and necessary source of friendliness between a public-school system and the community which it serves. . . . .

P. Commercial, semicommercial, and philanthropic enterprises have long sought, and in many cases gained, access to the school children and teachers through the schools. The schools should promote only those enterprises which represent the best interests of the children in their charge and should refuse to allow them to be exploited in any way whatever.

Q. We view with disfavor the tendency toward the multiplication of district, sectional, state, and national contests. These contests now embrace every conceivable activity—some conducted by professional organizations with a high purpose, but many representing only thinly veiled commercial interests. Regardless of sponsorship these state contests involve almost certain disorganization of school work, the solicitation of funds for their financial support, special preparation, and great nervous strain on the part of the contestants. Therefore, we feel that such district, state, and national contests should be discouraged, and eventually, unless of proved social and educational benefit, abolished. We also go on record as opposed to prize-essay contests and other individual competitions for material rewards.

R. The increasing demand upon the schools for the observance of special "days," "weeks," holidays, and half-holidays has increased to the extent that it presents a real problem in school administration. Many of these observances have little or no educational value and represent an attempt of commercial interests to advertise in the schools. Others, with more respectable sponsorship, do not make a contribution to the educational life of the schools commensurate with the effort and the energy required properly to administer them. When the

relatively short time that pupils are in school, the cost of each school day, and the difficulty of finding time to carry out the school program are considered, it is apparent that administrators and boards of education must take steps to discourage such encroachments upon the work of the schools. This department recommends that school administrators set up standards by which to measure the value of these requests and that a definite limit be placed upon the number of school projects to be undertaken in any one school year. . . . .

U. In closing we pay tribute to those teachers, principals, and others connected with our public schools who, under most difficult and trying conditions and at great self-sacrifice, have demonstrated unusual devotion and loyalty to their tasks. In spite of an uncertain future, of reduced salaries, of payless pay days, they have remained at their posts; they have performed their duties conscientiously; they have, from slender savings, given generously to the support of public-relief measures; and they have provided thousands of school children with food and clothing. Their example is an inspiration to all of us. They have proved anew that the true teacher is concerned primarily, not with money, but with the welfare of the children under his care.

RELATIVE MERITS OF CURSIVE AND MANUSCRIPT WRITING

Within the past ten years a wide-spread interest in the so-called "manuscript method" of teaching handwriting has developed in the United States. Enthusiastic advocates of this method have made somewhat extravagant claims both with respect to its superiority as a method of teaching handwriting and with respect to its effect on learning in other subjects, such as spelling and reading. A number of experiments have been conducted to discover the relative merits of the manuscript and cursive methods. In a recent number of the *Review of Educational Research*, Professor Frank N. Freeman summarizes the evidence as follows:

The extensive advocacy of manuscript writing and the rather wide experimentation in the schools with this style of writing create a demand for scientific evidence concerning its suitability. *Ex parte* statements of the supporters of manuscript writing concerning its beauty, legibility, and speed have been discounted because they have not been supported with data from completely described experiments. Important questions concerning manuscript writing in comparison with cursive are the ease with which it can be learned, its attractiveness to children, its legibility, and the speed with which it can be written. The two main practical questions concerning it are: first, whether it should be introduced into the first two or three grades and then changed over to cursive writing; and, second, whether it should be introduced at the beginning and retained as a permanent style of writing.

Studies of Manuscript and Cursive Writing

An early experiment by Reeder[1] sought particularly to determine whether fourth- and fifth-grade children could learn to write manuscript writing with a speed equal to the norm. Several fourth- and fifth-grade classes practiced for three days a week from January to April in attempting to speed up their manuscript writing, and three fifth-grade classes made a similar attempt with cursive writing. Rather paradoxically, the manuscript group gained more in speed, and the cursive group gained more in quality. Neither group was up to the norm in speed at the end of the period though the manuscript group was more nearly up to it. The manuscript group was somewhat superior to the cursive group in quality. This somewhat paradoxical result in reference to speed was contradicted by later experiments.

A study of the legibility and speed of the writing of pupils in a practice school using manuscript writing and of the parallel group in general public schools from Grades II to VI was made by Turner.[2] Legibility was measured by reading the writing in a mirror in order to slow down the reading sufficiently to make it measurable. Mirror reading slows down the reading and makes part of it letter-by-letter reading, and therefore, emphasizes letter legibility as contrasted with word legibility. This procedure naturally favors writing in which the letters are separated. Turner found that the manuscript writing was read at the rate of about 1.4 words per second and the cursive at 1.1 words per second. Similarly, she found that meaningless combinations of consonants could be read in a tachistoscope with fewer exposures in the case of manuscript than of cursive writing. In speed, the manuscript writing was faster up to Grade V, but the cursive writing passed the manuscript writing at Grade VI. The cursive writing increased in speed regularly up to Grade VI, whereas the manuscript writing did not increase beyond Grade IV.

A third experiment, by Gates and Brown,[3] gave rather definitive answers to some of the important questions. A comparison of the learning of manuscript and cursive writing during the first year indicated that the pupils wrote manuscript writing of a somewhat better quality than the cursive writing and that they developed a considerably greater initial speed in manuscript writing. The difference in speed was largely due to the fact that the speed in cursive writing did not begin to increase until about a month and a half. In the second part of the experiment a comparison was made between the manuscript and cursive writing of pupils from Grades II to VI who were given intensive training for the purpose of increasing the speed of manuscript writing. During the training they

[1] Edwin H. Reeder, "An Experiment with Manuscript Writing in the Horace Mann School," *Teachers College Record*, XXVIII (November, 1926), 255–60.

[2] Olive G. Turner, "The Comparative Legibility and Speed of Manuscript and Cursive Writing," *Elementary School Journal*, XXX (June, 1930), 780–86.

[3] Arthur I. Gates and Helen Brown, "Experimental Comparisons of Print-Script and Cursive Writing," *Journal of Educational Research*, XX (June, 1929), 1–14.

did not use cursive writing except very incidentally. At the end of the period the pupils in the first three grades wrote manuscript writing with somewhat higher quality than cursive writing and with much higher speed. In the fourth to the sixth grades the quality of the manuscript writing was also somewhat superior, but the speed of the cursive writing, in spite of the fact that cursive writing had not been practiced, was definitely superior. In a third experiment a comparison was made between the gains of two sixth-grade classes, one of which practiced manuscript writing from February to June and the other cursive writing for the same period. The two groups gained about the same amount in quality, but the cursive group gained twice as much in speed. At the end of the period, when writing at maximum speed, the cursive group wrote 111 letters a minute with a quality of 10.55, whereas the print group wrote only 94.2 words a minute with 10.3 quality. In other words, the manuscript group could not speed up as much as the cursive group and, when it did attempt to speed up, it was at a sacrifice of quality. An inquiry regarding the interest in the two types of writing indicated that pupils in the first two grades favored manuscript, whereas in the upper grades there was no marked difference. In a brief supplementary experiment it was found that pupils in the first three grades, who had had only manuscript writing, could shift to cursive writing and in three weeks gain about half the difference between their manuscript and their cursive writing.

Winch[1] made a series of six experiments to measure particularly the effect of changing from one style of writing to the other. In three of the experiments the change was made from manuscript to cursive writing; in one, from cursive to manuscript; and in two, from manuscript to a joined manuscript style. The experiments were made mostly in the upper grades from the fourth to the seventh. In most cases there was a loss in speed as a result of the change. In the only case in which the change was made in the second or the third grade, however, greater facility was attained in the new method. When the change was made as early as the fourth grade, the new method was either more rapid than or nearly as rapid as the old. The general conclusion was that if the change is to be made, it should be made early.

A detailed analysis of the movement used in manuscript and in cursive writing gave some basis for the interpretation of the results of tests. Gray[2] made an analysis, by means of the motion picture, of the manuscript and the cursive writing of ten adults, all of whom used both styles of writing, and of the manuscript writing of ten children with the cursive writing of ten other comparable children. The hand position and the general character of the movement did not differ markedly in the two styles of writing. The chief difference lay in the de-

[1] W. H. Winch, "Print-Script and Cursive-Script in Schools: An Investigation in Nervo-Muscular Readjustments," *Forum of Education*, IV (June and November, 1926), 123–38, 206–22.

[2] William Henry Gray, "An Experimental Comparison of the Movements in Manuscript Writing and Cursive Writing," *Journal of Educational Psychology*, XXI (April, 1930), 259–72.

tails of the execution of the movement as indicated by the analysis of the speed changes. This analysis showed the effect on the movement of the numerous liftings of the pen required in manuscript writing as compared with cursive writing. The effect of these liftings, in general, was to reduce markedly the speed of the writing. This difference is the indirect result of the fact that in manuscript writing the strokes are separated, whereas in cursive writing they are connected. Negatively the difference is not due to any difference in the rapidity of the movement of the pen through the air rather than across the paper. It is, however, due to two facts: First, the disconnecting of the strokes produces a greater number of pauses in the movement; second, the individual strokes of manuscript writing do not attain as high a speed as do those in cursive writing. The continuation of the strokes in cursive writing makes possible a higher speed in the middle of the stroke than is possible with the disconnected stroke of manuscript writing. In other words, manuscript writing is produced by a drawing movement which is frequently separated by pauses.

This analysis by the motion picture explained the result found by tests. A rather slow drawing movement with numerous pauses at the beginning of the strokes favors the production of accurate forms and, therefore, a highly legible style of writing. In the earlier years this style of writing does not hinder speed since all the child's writing is somewhat of the same character. The child has not yet developed the co-ordination necessary for the fluent cursive writing. Cursive writing is still somewhat of the character of drawing. As he develops the rhythmic swing of cursive writing in the fifth or the sixth grade and above, however, cursive writing begins to draw away from manuscript writing in speed and fluency until in the adult the difference is very marked. The older child or the adult, as shown by Conard and Offerman,[1] may readily develop manuscript writing or may use it for the production of certain effects, but manuscript writing cannot be written as rapidly as cursive writing without sacrificing its essential merits.

A recent volume by Thelma G. Voorhis, entitled *The Relative Merits of Cursive and Manuscript Writing*, also summarizes the evidence with respect to the relative merits of the two methods. Voorhis reports the results of her investigation made to discover the influence of the two methods on beginning reading. The experiment was conducted in six first-grade classes of a public school in Brooklyn. Two groups of atypical children were excluded from the experiment, one consisting of children whose intelligence quotients were below 72 and the other of children who made up a "rapid-advance"

[1] Edith U. Conard and Elizabeth J. Offerman, "A Test of Speed and Quality in Manuscript Writing as Learned by Adults," *Teachers College Record*, XXXI (February, 1930), 449–67.

class. The cursive and manuscript groups were practically equal in chronological age, but there was a difference in intelligence in favor of the manuscript group. "The range of I.Q.'s for the cursive group was 72–127 with the mean at 92.33 and the standard deviation 11.81. In the manuscript group the range was 72–119 with the mean at 96.35 and the standard deviation 9.64." For a limited group, however, the difference in intelligence quotients was eliminated. The findings of Voorhis' investigation are summarized as follows:

In interpreting the results of this experiment it is necessary to keep in mind certain limitations. In no case was there as large a number of children as was desirable. In some cases the groups were exceedingly small. Statistical interpretation in such cases is highly unreliable and is included in this report as suggestive of general trends and not as precise and conclusive evidence.

It should be remembered also that the children in the manuscript group had a slight advantage in general mental level, having about four points higher I.Q., on the average, than the children in the cursive group. However, this advantage was eliminated by the selection of two smaller groups that were equivalent in I.Q.

With these qualifications we may report the findings of this experiment as follows:

1. Distribution of reading scores of pupils in each group without regard to kindergarten training, sex, or general mental level points to the decided superiority of manuscript over cursive writing in its influence on beginning reading.

2. There was almost no difference between the scores of the boys and the scores of the girls. At the beginning of the experiment the boys' and girls' reading scores were practically identical. In June the difference between the means was less than one and a half words in the girls' favor, a difference that is statistically insignificant.

3. The children with kindergarten training scored approximately one-half word higher, on the average, in the June survey than did the non-kindergarten-trained children. Although this difference is small, it is fairly reliable. However, the difference between the kindergarten and non-kindergarten groups was very slight when compared with the difference between the cursive and manuscript groups. Thus it appears that for these particular children, attendance in kindergarten has much less influence on reading than has the choice of form of handwriting.

4. While it cannot be claimed that the teachers in the two groups were strictly equated in this experiment, an attempt was made to reduce the factor of teacher personality to a minimum. One cursive and one manuscript teacher of approximately equal training and experience exchanged classes at mid-year, while each of the remaining eight teachers taught an experimental group only one term.

No cursive group reached or exceeded the mean score of any manuscript group.

5. Manuscript writing is distinctly superior to cursive writing in its effect upon reading for each of the five mental-level groups studied.

All the data from this investigation indicate that manuscript is distinctly superior to cursive writing in the facilitation of beginning reading.

It is possible that the use of a less phonetic method of teaching reading would reflect less transfer from the manuscript writing. Also, it is possible that a different group of teachers would achieve different results. Repetition of the experiment, however, would probably yield a difference in the same direction, that is, in favor of the manuscript group, though the difference might not be as great as that found to exist between the two groups in the present investigation.

While it has always been recognized that there was a close relationship between reading and writing, authors of first-grade primers and readers express widely differing opinions concerning the influence of manuscript writing on reading. Of forty-five reading manuals examined, four authors prescribed script, seventeen recommended print, nine made no choice, twelve suggested a combination of print and script for blackboard and seat work, while three made no mention of handwriting. Of sixty-two authors of primary readers (exclusive of those mentioned above), sixteen favored script, ten favored print, eleven made no choice, twenty recommended a combination of methods, while five made no mention of type of handwriting to be used in word drills. In no case was experimental evidence submitted in support of the author's opinion.

If the real influence of manuscript writing on beginning reading is as great as that indicated by the results of the writer's study, primary teachers and supervisors should take cognizance of the fact in their classroom practice. Authors of primary readers might well suggest in their teachers' manuals the use of manuscript writing.

THE LIBRARY IN THE ELEMENTARY SCHOOLS OF NEW YORK STATE

The newly formed New York State Association of Elementary Principals has published its first bulletin under the title *The Library in the Elementary School*. This bulletin gives a detailed account of the state-wide experimentation with library service which the assistant commissioner for elementary education, J. Cayce Morrison, has described as the most significant development in New York's elementary schools. The following statement indicates the purposes and scope of the investigation.

The objectives of this study of the library in the elementary school have been to reveal present practices in elementary-school library service, to discover outstanding developments, to present the advantages and disadvantages of class-

room libraries, to consider the central library, and to encourage the formulation of standards whereby elementary principals may judge the effectiveness of their library service. The first of these objectives is presented in this report, which includes a study of size of the classroom library, its use during school hours, the loaning of books for home use, and the physical equipment provided. Consideration of central library, expenditure for books, methods of arousing interest in books, magazines provided, and objectives as understood by principals are also included in the study. The other four objectives are discussed elsewhere in this publication.

Data were gathered from 478 of the 1,156 elementary schools in the state outside of Greater New York. It was found that 83 per cent of the schools including Grades I–VI have classroom libraries. Libraries of this type were also found in 75 per cent of the schools having the seventh and eighth grades. Classroom libraries having from 26 to 50 books were found to be the most prevalent. In 60 per cent of the schools the upper limit of the number of books in the classroom library was 50, and in 30 per cent of the schools the upper limit was 25.

Nearly all the schools permitted pupils above the fourth grade to take books home. With respect to the use of library books in school, the following practices are reported.

Most of the schools allow the pupils to read library books during school hours under certain conditions. There are 361 schools, or 75 per cent of those reporting, which permit pupils to read library books during school hours after finishing their regular work. It must be that the command to fold hands and sit up straight is not given so often as it was thirty years ago. Why shouldn't pupils be allowed to go quietly to the library table to read or read at their seats after their work is done? Reference or supplementary reading is becoming more and more a part of the regular assignment as the textbook decreases in importance. It is interesting to note that the village schools give greater freedom in the use of library books than either of the other two types of schools. There are 340 schools, or 71 per cent, in which the library books are used as part of the assignment, and 225 in which they are used during a regular library period. The question concerning a regular library period did not include frequency of this period, but it is inferred that such a period is at least once a week or oftener. In 143 schools library books may be read during the study period while in 119 schools library books are used during the regular reading period. Here again is an unsolved problem. What is the best method of using classroom library books during school hours? Several principals might conduct an investigation on this problem.

The following statement is made with respect to separate library rooms.

Library corners in classrooms are far more numerous than separate library rooms. Fifty-eight principals state that they have a library room for the use of all pupils; only six claim a library for the primary grades. A library room for Grades IV–VI is reported by seventy-three schools and for Grades VII–IX by sixty schools. By omitting branch public libraries maintained in school buildings, there are found to be 150 schools having a separate library room for part or all of the grades. These figures can be used only to show trends as there are many different grade combinations which use a separate library room where one is provided.

Where separate library rooms are provided there is wide variation in the number of books. The separate library room may vary from a small cubby-hole with less than one hundred reference books to the large well-equipped room served by a trained librarian. The median number of books which these 150 schools claim to have in their separate library rooms is 750. The largest library reported has 5,500 books, while 25 school libraries exceed 2,000 books. There are such variations in what is actually understood to be a library room that no definite inference may be drawn.

Only twenty-seven schools, or less than 6 per cent of those reporting, had trained, full-time librarians.

REPLIES CONCERNING LIBRARY EXPENDITURES PER YEAR PER PUPIL FROM 294 SCHOOLS

Expenditure per Year per Pupil	Number of Cities	Number of Villages	Number of Schools under District Superintendents	Total
$ .00.....	3	1	2	6
.01– .25.....	74	17	19	110
.26– .50.....	48	21	22	91
.51– .75.....	11	12	12	35
.76–1.00.....	6	11	9	26
1.01 and up...	4	12	11	27

The data with respect to the expenditure for libraries reveal that the great majority of the schools are not spending an adequate amount for the maintenance of an efficient library service. The accompanying table indicates that the villages are much more liberal than the cities in their expenditures for libraries.

The bulletin contains a number of discussions of such topics as the development of a library, books for the elementary-school li-

brary, the enrichment of the curriculum through the library, how the librarians work with teachers, how the librarian serves several elementary schools, selection of current publications for classroom libraries, and teaching teachers to use an elementary-school library. It also contains an annotated bibliography on elementary-school service and other helpful bibliographical data.

This bulletin should prove exceedingly helpful, not only to the teachers in the elementary schools of the state of New York, but to superintendents, principals, and teachers everywhere who are facing the problems of improving their library practices.

NEW EDUCATIONAL MAGAZINES

The School of Education of Northwestern University announces the publication of a new educational periodical bearing the title *Educational Trends*. The nature and purpose of the new publication are described as follows:

> The essential character of the publication is indicated by the subtitle, "A Journal of Research and Interpretation." Its purpose is to make available to those interested the results of significant researches carried on by members of the staff and those co-operating with them; and to suggest such conclusions or hypotheses on various educational problems as may seem timely.
>
> Those responsible for the publication recognize the demand which is obviously becoming more insistent that increased attention be given to interpretations of educational theories and practices in terms of outcomes. This phase of educational emphasis will therefore receive attention in succeeding numbers.

The first issue of the journal contains summaries of four investigations conducted by members of the staff and graduate students of the School of Education of Northwestern University. The first of these is a study of practices in special classes for mentally subnormal children. The second study is an analysis of the occurrence of dependent clauses in the writing of school children in Grades IV–IX. The third investigation is an analysis of the mental status of crippled children. The fourth study presents certain phases of the social code of a number of graduate students.

It appears that editorial responsibility for the journal will be assumed by the various members of the staff of the School of Education, one member being responsible for a particular issue. No subscription rates are announced.

The College of Education of Howard University, Washington, D.C., announces the publication of the *Journal of Negro Education*, the first issue of which will appear in April. The journal will be issued quarterly and will be devoted to the discussion of problems incident to the education of negroes. The first issue will contain articles entitled "The Report of the National Advisory Committee on Education and the Problem of Negro Education," "The South's Negro Teaching Force," "Cincinnati's Experiment in Negro Education," "The Accreditment of the Negro High School," "Changes in the Intelligence Quotients of Negro Children," "The Legal Trend toward Equalization of Racial Opportunities for Education in the United States between 1920 and 1930," and other articles dealing with the history of the education of the negro. Charles H. Thompson is the editor of the new magazine. Associated with him are a board of associate editors, an editorial committee, and a contributing and advisory staff consisting of a large number of persons prominent in the field of negro education. The journal is published at Prince and Lemon Streets, Lancaster, Pennsylvania. The subscription price is $2.50.

A third new educational magazine bears the title *School Management*. The magazine will deal with the administration, equipment, and construction of schools. In the first issue is an article by John Dewey entitled "America Needs an Entirely New Educational System." The editor writes an article entitled "What Is To Be Done about School Budget Cuts?" Grant Rowell contributes an article on "Equipping School Health Rooms." Regular features of the magazine are "Projects and Programs for Parent-Teacher Associations," "How Other Schools Do It," "The School Lunch Room," and "A Check List of New Text Books."

The magazine is edited by Clyde R. Miller, director of the Bureau of Educational Service, Teachers College, Columbia University. George J. Hecht is the president and publisher. The offices of the magazine are at 114 East Thirty-second Street, New York.

TEN YEARS OF THE "GRUNDSCHULE"

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THE CONSTITUTIONAL AND LEGISLATIVE PROVISIONS FOR THE "GRUNDSCHULE"

In the course of her modern history Germany has repeatedly and successfully sought through the improvement of the education of her youth to effect a recovery from military catastrophes and the resulting political and economic difficulties. The honorable, as it has been salutary, tradition was inaugurated, in a sense, by Frederick the Great himself. The next and much more conspicuous and brilliant application of the method is connected with the name of Baron von Stein, the chief adviser to King Frederick William III of Prussia at the time of the Napoleonic wars. That remarkable Prussian statesman, supported by two collaborators who were themselves statesmen of a high order, the philosopher Fichte and the scholar William von Humboldt, reorganized the public education of his country. The Prussian educational system was solidly placed, during the eventful and tragic years 1807–9, on a basis that was more generous and better designed to mobilize the creative forces of the nation than that of any other educational system existing in Europe at the beginning of the nineteenth century. The reform rapidly bore fruit. The Prussian schoolmaster, who is credited with a large share in the victory over the armies of Napoleon III at Sedan in September, 1870, undoubtedly did his bit also in the battle of Leipzig in October, 1813, when the armies of Napoleon I were seriously defeated. The liberation of the whole of Germany from foreign domination, the swift cultural, scientific, and commercial growth of the German states, and, finally, the unification of the states within the German Empire were the direct or indirect repercussions of the educational reforms promoted by Stein, Fichte, and Humboldt.

It was consequently in keeping with an old tradition, the value of which had been proved by the history of modern Germany, that the German Constituent Assembly which gathered at Weimar in February, 1919, occupied much of its time with educational problems. It was in harmony with the lessons taught by past recoveries from overwhelming anxieties that the Weimar Constitution, the first constitution ever voted by the sovereign German people, should include several provisions for educational reforms. Some of the educational clauses of the constitution bear very evident traces of conflict and compromise between the more radical demagogic or merely progressive democratic groups in the assembly, on the one side, and the conservative or purely anti-revolutionary, monarchist wing, on the other. Some of the educational provisions evolving from a meeting of such groups were naturally given vague evasive wording. Some have remained almost dead letters awaiting the awakening clamor of the legislator.

Among the educational provisions given unmistakable meaning by the constitution and already translated into actualities of the German educational life—one of the most significant and interesting to the student of educational sociology—is the clause which inaugurated the common primary school (*die Grundschule*), now in its eleventh year of operation. The clause reads as follows: "The public-school system shall be organically constructed. The intermediate- and secondary-school system shall be developed on the basis of a *Grundschule* common to all" (Art. 146). In other words, the constitution has created a public primary school, which all children of the nation are obliged to attend, to serve as a compulsory, common foundation (hence the term *Grundschule*) for all further education of the child. The constitution left it to the legislators to determine the length of the compulsory attendance at the *Grundschule*, as well as its articulation with further levels of the educational system. Without much delay the German Federal House of Representatives (*Reichstag*) enacted the Federal School Law of April 28, 1920, which translated the constitutional provision relative to the *Grundschule* into administrative measures. Rejecting the demand of the radical wing of the *Reichstag* for an eight-year *Grundschule*, the majority of the house voted to establish a four-year school which

all the children of the nation must attend between the ages of six and ten. The law made it optional with the legislatures of the states of the federation to increase the length of the *Grundschule* instruction, but this privilege has been left in abeyance by all the states.

Section 4 of the 1920 law provides exemption from compulsory attendance at the *Grundschule:*

> Private instruction for an individual child or private group instruction for children of several families who would unite for the purpose can be permitted instead of attendance at the *Grundschule* in exceptional cases only. Exemption can be based on extraordinarily dangerous condition of the child's health, or upon an unusually great distance of the child's domicile from the school, and upon similar pressing circumstances.

Foreseeing the tendency to interpret the exemption clause too widely, the legislators wrote into the law the prescription that "an endangered condition of the health of a child shall not in itself entitle to private instruction. Generally, there will arise the question of postponing instruction. In that case compulsory attendance of the child at the *Grundschule* will be correspondingly extended upward." Imagine, for example, that the mother of a German boy, before the beginning of the school year in which her son should begin his compulsory attendance at a *Grundschule*, calls at the office of the district school inspector, whose duty it is to supervise the application of the *Grundschule* law. Imagine, further, that the lady remonstrates with the educational officer against sending her boy, who she knows is of delicate health, to a *Grundschule* and thus throwing him into association with the cook's boys and other less delicate children. Unless the pleading should be indorsed by a valid medical certificate, the inspector is empowered by the law to advise the solicitous parent that she may keep her son at home for a year or so until she feels he has become stronger and that the child shall then go to a *Grundschule* and spend there the entire period of time prescribed by the law. As the law, furthermore, directs that no child who cannot produce a certificate showing attendance at the *Grundschule* or a certificate of exemption from the *Grundschule* attendance can be admitted to any school receiving children beyond the *Grundschule* age, the parents who are little in sympathy with the *Grundschule* avoid demanding exemption for their children on the ground of delicate health.

That line of argument may lead to the retardation of the entire educational career of the child. Besides, section 5 of the *Grundschule* law of April 28, 1920, specifying the objective medical grounds on which exemption may be secured, is an important addition to the efficient enforcement of *Grundschule* attendance. The section in question reads: "The provisions of this law do not apply to the instruction and education of the children who are blind, deaf and dumb, hard of hearing, defective in speech, feeble-minded, chronically ill, morally dangerous, or crippled, nor to the educational institutions set aside for the instruction and education of such children." It can be readily seen that, without a really serious ground, parents would not be inclined to have their child considered a member of such a varied, but invariably unfortunate, group.

The *Grundschule* law was modified by the Federal Education Act of April 18, 1925. Under the provisions of this act the *Grundschule* attendance of an exceptionally capable child of good health may be reduced to three years instead of four. Again the law contains an array of checks on a possible tendency to make a rule of the exception. Among others the law discriminates against those candidates for accelerated *Grundschule* studies who are or may be coached privately and thus artificially forced into the category of exceptionally able pupils. Special examining committees have to be satisfied that the child recommended by his teacher and principal for accelerated graduation from the *Grundschule* is physically and educationally ready for the work of the initial grade of the secondary school. Only then can the regional educational board issue the authorization for accelerated graduation from the *Grundschule*.

All evidence which the writer secured both from official documents and from private observations seems to attest to an efficient operation of the *Grundschule* law throughout Germany.

THE HISTORICAL AND SOCIOLOGICAL BACKGROUND OF THE "GRUNDSCHULE"

The idea of a primary school which all children should be required to attend is at least as old as the Aristotelian political philosophy, to say nothing of the Spartan common school for the male children of the full-fledged Spartan citizens. Several times in the course of the

history of education the idea has been restated with variations, for instance, by Comenius in his *Didactica magna* and in the projects of educational reform in France submitted to the legislative assembly and, especially, to the National Convention of the Revolution. In nineteenth-century Germany the elementary-school teachers were partisans of the common-school idea, but its realization had to wait until the revolution of November, 1918, and the humiliating Treaty of Versailles had prepared the way for the institution expected by its promoters to serve as the basis of the consolidation of the German national and cultural unity. It is interesting to note that an almost exact wording of the section of the constitution of August 11, 1919, providing for the *Grundschule* is found in a resolution adopted by the seventeenth annual convention of the elementary-school teachers of the state of Hesse in 1886. The resolution contains the following passage.

> Lack of articulation in our school system reflects itself in the absence of unity within the German people. Therefore, it is to be desired that the German educational institutions form a common school, that is, an articulated whole. The German common school should be articulated in the following way: (*a*) the foundation of the common-school system should be a primary school where *all* children would be taught during the first four years of their school career; (*b*) the elementary school and the secondary school should each be built upon the common primary school.

Just such a school organization was established by the Weimar Constitution and the *Grundschule* law of 1920. Today every German child residing in his country, unless ill or abnormal, must receive the *Grundschule* education for four years, or in exceptional cases for three years. After that, his parents or guardians may decide whether he will fulfil the rest of the compulsory school attendance at an elementary school or go to a higher elementary, secondary, or trade school.

The respectability of the historical age of the *Grundschule* idea does not, of course, endear it to those German parents who consider it an imposition on, and curtailment of, the natural rights of the family. The attitude of the more moderate opponents to the sovereign claim of the public school on the education of the children is well portrayed in the following dialogue adapted from the *Allgemeine deutsche Lehrerzeitung* for March 5, 1931. The dialogue takes

place in the office of an elementary-school principal in Germany. The characters of the dialogue are the principal and several parents. Some among the latter are provided with legal books.

A mother: "Is the education of my daughter going to be shaped in accordance with my wishes or with the school policies? Who shall have the power to decide —the school or the family, teachers or parents?"

A father (joining the conversation): "The right of parents clearly has priority. Does not the constitution say that 'the education of the progeny for physical, social, and spiritual proficiency is the supreme duty and a natural right of parents'?"

The principal: "True. But the constitution says this with an emphatic addition to the effect that the state shall regulate the functioning of parental rights by the enactment of necessary laws and school ordinances."

The father: "Yes. But the first paragraph of the federal Youth Welfare Act states that the desire to give a certain direction to the education of a child on the part of persons having a natural right or duly authorized to exercise such direction can be overruled only under certain specific provisions of the law. Consequently, when teachers are determined to influence my children in a direction contrary to my wishes, it is a clear case of unlawful interference on the part of the school with the educational rights of a father."

The mother: "And when I do not want my daughter to take part in certain school pageants, the school has no right to force my daughter to do so."

The principal: "I must disagree with both of you. The laws which regulate school life practically never employ the term 'education' but speak of 'development.' Numerous ministerial ordinances, on the other hand, regulate in an exact manner the rights of the school with relation to 'education.' "

The father: "And yet, is it not true that ministerial ordinances cannot be valid except when they are based on the law and not when they contradict it?"

The principal: "That is correct. Still I do not see any contradiction between the law and the right of the school to give a certain direction to education. You know that parents whose natural right it is to educate their children can delegate their rights to the school. When parents send their children to school, does that not imply a tacit transference of their rights to the school during the time spent by the children in school?"

The mother: "I am not sending my daughter to the public school of my own free will. It is in order to avoid annoyances and fines that I send my daughter there. If I were free to choose, I would rather have her taught at home. I do not admit that voluntary transfer of the educational rights of parents about which you are talking."

Another mother (to the principal): "If you admit that the school derives its educational rights from the powers delegated to it by parents, then does it not follow that the school is nothing more than an auxiliary of the home and consequently has to shape its work according to the parents' wishes?"

The principal (speaking with grave emphasis): "No. Irrespective of whether parents delegate their natural educational rights to the school willingly or not, the latter has a natural authority over children while they are under its care and responsibility. That authority is a logical consequence of the purpose of public education and of the necessity of maintaining discipline. Otherwise, the school cannot discharge its national duty. Furthermore, decisions of the Supreme Court have repeatedly recognized the school as an educational, that is,character-building, institution and not merely a place where instruction is given. They have recognized the teacher as a state officer, who derives his authority over pupils not only from the rights delegated to the school by parents but above all from his office, which he holds under public law. The Supreme Court has also ruled that parental educational rights are limited by the lawful purposes and duties of the school. Parents who would ignore or neglect that would accomplish nothing except to incur fines provided by law and ministerial ordinances."

However dictatorial it may seem to an outsider, the argument presented in the dialogue by the school principal, who speaks for the state, seems to be backed up by the majority of the representatives of the German people in the *Reichstag*. For that reason the *Grundschule* law persists. Indeed, it has a solid foundation in the German tradition of the *Kulturstaat*, that is, the enlightened and enlightening state as the guardian of the national culture and guarantor of high standards of educational achievement. As such, the state certificates all professional people, inclusive, of course, of teachers. Moreover, the encouragement of educational developments, particularly in higher education, has traditionally come from the state. The list of the German higher institutions of learning and research is a long and not inglorious memorial to heads of German states, founders of institutions which often were engaged in a competition as noble as that of the American states, municipalities, and private benefactors in matters educational. The *Kulturstaat* idea has become an article of the political credo of the man in the street in Germany. Republic or no republic, to deprive the German state of its traditional educational authority would be as difficult as to invest the state with the right of educational monopoly in this country, where such institutions as Harvard University, Yale University, Columbia University, Johns Hopkins University, the University of Chicago, Duke University, George Peabody College for Teachers, and many others are so many undying sentries and protectors of the principle of individual initiative in the cultural growth of America.

The *Kulturstaat* idea, which is the fundamental aspect of German educational sociology, is in turn firmly imbedded in another sociological rock furnished by the Hegelian conception of the state. The great Prussian philosopher, Hegel, in his work *Grundlinien der Philosophie des Rechts* formulated the absolutist theory of the state. His inspiration came from two sources. The one was the political actualities of Prussia, which was efficiently and intelligently governed by the kings and their loyal bureaucracy and led by them to the position of a considerable international prestige. The other was the ancient Greek conception of the state. To Hegel the state is the highest form of social organization, a moral personality, the guarantor, and in a certain sense the creator, of the real personality of the individual. The individual can have no *real* rights which conflict with those of the state because the *real* rights of the individual are not those which he has brought with him from some hypothetical pre-state condition of society but the right to pursue and attain to certain real ends which his fully developed nature sets before him. The state alone makes it possible for him to do so. Since the individual receives his *real* rights from the state, he cannot have any rights which conflict with those of the state.

The kingship of Prussia and all other German kingships and dukedoms are gone, but the German popular conception of the state to which Hegel gave a solemn philosophical form stands as the basis of the *Kulturstaat* idea, which continues to be the keystone of German educational sociology. If anything at all serious has happened to the absolutist Hegelian state under the republican régime installed in Germany by the revolution in 1918, then it is a change in the direction of the Athenian absolutist conception of the state. In contrast to the autocratic times in Germany, when the heads of the states and the officers were independent of the will of the people, now in republican Germany the authority of the state is supreme; but the principal officers, bearers of that authority, are subject to change and are invested with authority during the pleasure of the people expressing their will through universal suffrage. At all events, the new German republican state is colored, educationally, by the establishment of the *Grundschule*, which is an expression in education of the absolutist idea of the state.

THE SOCIAL AND EDUCATIONAL SIGNIFICANCE OF THE "GRUNDSCHULE"

The German electorate, educated in the traditions of the absolutist conception of the state and the *Kulturstaat* idea, whole-heartedly supports the *Grundschule*. The institution was established in the expectation of an integrating influence which it was to exercise. The enthusiasts of the *Grundschule* assure us that such is its manifest contribution. An example of a profession of faith in the integrating national influence is a story taken from the *Allgemeine deutsche Lehrerzeitung* for April 23, 1931, entitled "*Aus der Arbeit der Grundschule.*" The author of the article relates an incident observed at a *Grundschule*. A delicate-looking boy hesitated to venture forth on the skating rink made by the *Grundschule* children and was making a little sliding path for himself. "Well, Hilde, are you making a private sliding path?" the writer of the article asked the child. Before the child could answer, we are told, there came an outcry from the crowd, "The people's skating rink is better." "The expression is a symbol of national consciousness," concludes the writer. Probably this is a somewhat hasty conclusion from an unusual occurrence. Yet, whatever may be the list of valid objections that a supporter of the contractual conception of the state and of the wider individual freedom can draw up against the *Kulturstaat* idea in general and the *Grundschule* in particular, there can be no serious doubt that a primary school which all children are obliged to attend is likely to add more to national cohesion than it takes from it.

Another thing appears to be clear. The *Grundschule* idea is in harmony with the German conception of the state. Therefore, it contributes to the internal harmony of German social life. Furthermore, every cultured nation, as every mature, intelligent individual, is the best judge of the kind of food that is best for its recovery. It is not improbable that the *Grundschule* teacher, who educates, with few exceptions, every German child during the first four years of his educational career, will be given by the historian of the revival of Germany after the war of 1914–18 as much credit as is given by the historian of the Germany of the nineteenth century to the elementary-school teacher of that period, who taught only the children of the lower social layers.

Finally, the fact that all children must attend the public *Grundschule* naturally causes more attention to be given the primary school by the more wealthy German families, who have always had more leisure and competence than the masses to bring to the improvement of the public primary school but who seldom did anything about the improvement of that school because their own children never attended it. Indirect as they may be, the educational consequences of the mobilization of the interest, even if it be the involuntary interest, of the middle and upper social strata of Germany in the *Grundschule* are likely to be significant for the national welfare of Germany and for her international standing, probably in a not far distant future.

SUMMARY OF READING INVESTIGATIONS (JULY 1, 1930, TO JUNE 30, 1931). III

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This article and an article which appeared in the March issue of the *Elementary School Journal* discuss the nature and scope of the reading investigations reported during 1930–31 and present some of the more significant findings.

Free reading versus intensive training.—Four studies were reported which were concerned with the values of free or extensive reading in promoting reading achievement. O'Brien (**76**)[1] compared the progress of pupils in Grades V and VI after they had had intensive training for five months and after they had been allowed to do wide reading for a year. The progress attained during the two periods, as measured by the Stanford Achievement Test led to the conclusions that normal and bright children who are at or above grade level require only a minimum of "mechanical and remedial instruction," that interest and wide reading cannot be depended on to increase the reading abilities of slow learners or to overcome real difficulties of any children, and that material suited to the level of the child should be provided both for definite instruction and for reading in connection with other interests and activities. The value of wide reading at the level of achievement attained by each child was also emphasized in a study reported by Heise (**48**).

Wildrick (**114**) conducted a controlled experiment with sixth-grade pupils in which one group followed the free-reading method for a year and the other followed a study-recitation method. The average gain made by the former group was slightly less than that made by the latter group. On the Sangren-Woody Reading Test the free-reading group excelled the study-recitation group in the tests of

[1] Numbers in parentheses refer to the numbered bibliography in the February issue of the *Elementary School Journal*. In the case of quotations page references are also given.

rate of reading, fact material, total meaning, and organization but not in word meaning, central thought, or following directions. The study-recitation group made distinctly superior progress in paragraph meaning as measured by the Stanford test. In a study with fifth- and sixth-grade pupils Scruggs (94) found that wide reading with specific training on the difficulties encountered by the pupils secured greater progress than the regular instruction prescribed by the course of study.

All four studies indicate that both wide reading and careful guidance have unique advantages. It follows that the program for any given class should be determined only after a careful study of the pupils' needs has been made.

Reading in the content subjects.—McCallister (66) studied the reading of seventh- and eighth-grade pupils in studying American history, mathematics, and general science. He discovered fifty difficulties which he classified under the following headings: those growing out of the pupils' methods of attack; those caused by inability to recognize relations; those arising from lack of knowledge of subject matter; those caused by deficiencies in vocabulary; those caused by inaccuracies; and those arising from lack of clearness in directions given to pupils. In a subsequent study (67) he found that needed guidance could be given with distinct advantage to the pupils in connection with the regular study activities of the course. "Such guidance may take the form of group instruction or, in extreme cases, of individual training. Either form results in noteworthy improvement in the effectiveness of instruction. Such guidance not only assists pupils with the regular work of a course but also stimulates independent effort and self-confidence" (67: 284).

Weaver (112) studied the relative value of intensive study and extensive reading in a seventh-grade course in United States history and concluded that the understanding of history gained by reading extensively from carefully selected accounts is as good as, if not better than, the understanding gained by reading a few such accounts intensively and preparing exercises focused on the accounts.

Pressey (84) made an analysis of the reading demands made on college students in studying the textbooks used in college courses and found that these demands included the following: ability to

read simple graphs, diagrams, tables, and formulas; ability to read fairly complex problems; and ability to read at least a half-dozen common types of text material. A test was developed and has been given to about one thousand college Freshmen. The scores varied from 7 to 57 (out of a possible 62) with a median of 30. It is obvious that many of the students are in need of specific types of training before they are able to read and study their textbooks intelligently.

Reading and literature.—Bamberger and Broening (2) prepared a very illuminating and helpful summary of experimental studies and teaching experience with respect to literature in the elementary-school grades. It deals with the nature of appreciation and literature, children's interests and literature, the preparation of a unit in literature, poetry in the elementary school, various other types of literature, and an articulated program of literature for the elementary-school grades. This investigation merits careful study by all interested in this field.

Garrison and Thomas (36) studied the relation between "vocabulary ability" and the following factors believed to contribute to appreciation of literature: discovery of theme, reader participation, and sensory imagery. The results of these three tests of literary appreciation were correlated with the results of three vocabulary tests (word-rhyming, word-building, and the Holley Sentence Vocabulary Scale). Significant correlations were found between the results of the first and third of these tests and each of the three literature-appreciation tests. These findings agree with the results of previous studies which emphasize the importance of vocabulary knowledge in appreciation of literature.

Reading interests and preferences.—The problem of reading interests and preferences has stimulated an unusual amount of careful investigation. Gorsline (43) and Hermans (49) studied the leisure-time activities of secondary-school pupils. They found that there was not only general interest in reading but that this interest ranked high. In the case of bright children, Burks, Jensen, and Terman (7) found that reading ranked highest among leisure-time activities. Uhrbrock (107) found that college Freshmen devoted only three and one-fourth hours a week to free reading and that the men with

records of high scholarship read slightly more than the men with low scholarship records. Lipscomb (62) in a study among sixth-grade pupils who were good readers found that the correlation between the amount read and reading achievement was greater than the correlation between the amount read and the intelligence quotient. Lewerenz (61) found that children who use the public library are more often than not of a superior type both mentally and scholastically and that many of subnormal mentality make no use of the library.

Dowell and Garrison (31) determined the most popular selections in third-grade readers and by analysis defined the ten most popular interest elements: kindness, bravery, happiness and beauty, humor, animals, story quality, achievement, love, Bible stories, and wisdom. Kealy (57) found that children liked spiritual stories provided these contained the same elements which make other kinds of stories interesting. In a study of the reading done by 5,510 junior high school pupils, Rinehart (90) found that these pupils were interested primarily in fiction. Short stories and books of travel and biography were also especially popular. The quality of the selections was found to be "amazingly gratifying." Beinhart (3) found that forty-three mentally retarded boys chose stories far below their age levels. In a study among both elementary-school and high-school pupils, Mitchell (71) found that boys preferred motion pictures to books, the preference being more universal among those in the elementary school than among those in high school. Boy Scouts liked to read about as much as they liked to go to the motion pictures. Younger girls preferred motion pictures to books, but older elementary-school and high-school girls preferred books.

Gates, Peardon, and Sartorius (39) carried on a series of studies concerning the types of material preferred in the primary grades. In one compilation the first choices number as follows: work-and-play exercises, 47; narratives, 26; informational selections, 20. As the authors point out, however, the comparisons are in a sense misleading since the interest in each was partly borrowed from the others.

Waples and Tyler (111) published the results of a series of studies of what adults like to read. Their technique and findings pave the way for much-needed research in this field.

Supervisory steps to improve instruction in reading.—Supervisory campaigns to improve instruction in reading were carried on and the results reported in seven centers. Daniel (**27**) reported steps taken among first-grade teachers in a county in Alabama to improve reading and thus reduce retardation. The procedures adopted included (1) the study of the abilities, interests, and needs of each child; (2) the provision of additional outside reading activities for pupils; and (3) the use of informal tests on word and phrase recognition as a means of checking the attainment of pupils. Supervisory help was provided through visits to each classroom. Demonstrations were given and various types of conferences held. The value of the campaign was shown by the fact that, although only 50 per cent of the pupils had been promoted during previous years, 85 per cent were promoted at the end of the year in which the campaign was carried on. This increase in the percentage of promotions was fully justified by the results of reading tests given in 1928–29 and 1929–30.

Case (**15**) reported marked improvement in the achievement of pupils in the sixth grades of Harrison County, Kentucky, through the use of circulars in providing help and stimulation to teachers.

Cutright and Riedell (**25**) made a survey of the activities of the reading period and found that the most frequent activities were divided among four objectives as follows: to establish fundamental habits and skills, 57.9 per cent; to develop permanent interests, 18.6 per cent; to establish habits of accurate and thoughtful independent reading, 0.3 per cent; to provide varied purposeful reading activities, 20.9 per cent. These findings resulted in pointed questions which were followed up by supervisory conferences.

McClure (**69**) describes a method by which supervisors may secure objective evidence concerning a teacher's recognition and grasp of the fundamental objectives of reading and their application.

Campaigns carried on by Cressman (**23**) in a county in Pennsylvania, by Roberts (**92**) in San Francisco, and by Gillentine (**40**) in the fifth grades in seven school systems in Tennessee all supply clear evidence of the notable results which can be achieved in improving instruction in reading through intelligently planned and carefully directed campaigns to that end.

Reading tests.—Various types of problems relating to reading tests

were studied intensively. Chandler and Williams (16) presented data which show clearly the value of tests in determining the progress and needs of fourth-grade pupils. As a result of their study, they recommended that schools "develop a supervisory technique which will determine objectively the readiness of pupils to use reading as a study tool. Since economic and social factors often determine promotions, the fourth-grade curriculum must be adjusted to the varying reading abilities of the pupils in that grade" (16: 454).

Broom, Douglas, and Rudd (5) and McAnulty and Clark (63, 64) were concerned with the validity of reading tests. In the first study it was found that some of the standardized tests, such as the Sangren-Woody Reading Test, the Haggerty Reading Examination, Sigma 3, and the Stanford Achievement Test (Advanced Examination), are highly valid but that tests of specialized reading skills are not valid tests of silent-reading comprehension. McAnulty and Clark studied the comparability of norms and the validity and reliability of ten tests for use in the primary grades and the reliability of ten tests for use in the middle grades. Their results for the latter group of tests showed that the following had the greatest reliability: Ingraham-Clark Diagnostic Reading Test, Part I; Gates Silent Reading Test, Type D; Sangren-Woody Reading Test; and the new Stanford (paragraph meaning and word meaning) test.

Shank (97) made an analysis of the types of responses required on silent-reading tests. The following six types of responses (and a miscellaneous group) were identified: those requiring the thought stated in the content, those requiring the thought implied in the content, the true-false type, following directions, those requiring the selection of words of similar or synonymous meaning, and those based on the recognition of word or content meaning in accompanying illustrations.

Hartley (47) developed a set of tests of appreciation of poetry which "afford measures of qualification for purposes of classification and selection of teachers of English" (47: 29).

Paterson and Tinker (79) studied the equivalence of the time-limit and work-limit methods of test administration and found that they agreed with each other as closely as each method agreed with itself.

The relative achievement of different groups.—Studies were made of

the relative achievements of rural and city children and of white and negro children which confirm the results of previous studies. McIntosh and Schrammel (70) found that the advantage of graded schools was greatest in the lower grades where the fundamentals were being acquired. Cole concluded that "from whatever point of view we study the data we are forced to conclude that the educational accomplishment in our rural schools is very poor" (19: 37), and he recommended that vigorous constructive steps be taken to equalize educational opportunities in the state studied (North Dakota).

Farr (35) and Hewitt (50) both secured evidence of the lower achievement of negro children. Hewitt pointed out the fact that in a school with a junior high school organization negro children put forth effort more nearly proportionate to their ability than did the pupils in schools with the traditional organization, that the slow group of colored children received most attention, and that the more intelligent negro child should be given greater opportunity for advancement.

Hygiene of reading.—Unusual interest has been expressed during the past year in the hygiene of reading, particularly in the legibility of print. Tinker (104) and Pyke (85) prepared summaries of previous investigations of the legibility of print. Gates (38) summarized studies relating to the length of line and concluded that additional evidence was necessary before final decisions could be reached. Tinker (102) found that old-style numerals are somewhat more legible than modern-style numerals when printed in isolation and much more legible when printed in groups. Both Holmes (55) and Paterson and Tinker (80) found that black print on a white background is more legible than white print on a black background. Chou (18) found that the left and upper halves of Chinese characters are more suggestive of whole characters than either right or lower halves. Buckingham (6) secured evidence which raises pointed questions concerning the wisdom of the use of print as large as has been customarily used in primary textbooks.

Corrective and remedial training.—More than one-sixth of the studies published during the year related to corrective and remedial training. It will be impossible here to do little more than to indicate the general types of problems studied.

Touton and Berry (106) reported types of reading disabilities among college entrants which show clearly the need of reading guidance at that level. McCallister (66) summarized fifty types of reading difficulties encountered by junior high school pupils in three content subjects and in a later article (67) described steps for correcting the difficulties. Woody (115) described various factors conditioning the reading process and illustrated their significance in a case which he reported.

Corrective and remedial training was given to groups of pupils at various levels of advancement. Cruise, Courtney, and Mitchell (24) and Gorham and Tracy (42) reported remedial training in Grades II–VIII given by teachers taking extension courses. Davis (28) described the remedial steps taken with poor readers in Grades IV–VI. Hilliard and Barnes (51) described the methods employed in improving pupils who were deficient in phases of reading measured by the Gates Silent Reading Test. Hogoboom (52) reported procedures adopted in improving reading achievement among slow learners in the seventh grade. Alexander (1) and Carney and Leuenberger (11) described the results of remedial measures at the high-school level, and Parr (78) reported similar steps among college students. McCallister (68) described corrective measures with four groups of poor readers: "decipherers," "slow learners," "slow, accurate readers," "word-readers." In every experiment the results were entirely gratifying. These facts supply evidence of both the need and the value of corrective and remedial training at all levels.

Several individual cases were described at length. Dreis (32) studied a pupil who had difficulty in recognizing word forms; Richards (89), a pupil deficient in visual imagery; Carter (14), a pupil weak in perceiving words and, in another study (13), a pupil who had defective vision; Phillips (82), six cases of dyslexia; and Richards (88), a severe case of reading disability in a left-handed child.

Two reports were concerned with the effect of changing the handedness of left-handed pupils. Fagan (34) found that changing the handedness of a boy who had learned to read had detrimental effects. Ojemann (77) found that in the cases studied there were few speech disorders following changes in handedness. This general field merits much further study.

CLASSIFICATION OF THE ESTIMATIONS IN TWO METHODS OF FINDING THE QUOTIENT IN LONG DIVISION

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In an earlier article[1] the writer showed that there are 44,550 estimations possible when the divisor contains two figures and the quotient not more than two. This number includes all divisors from 11 to 99, inclusive, except the decade divisors, as 20, 30, etc. When the apparent method is used for estimating the quotient for all divisors having the units' digit from 1 to 8 and the nine two-figure numbers ending in 9 are increased to the next decade number, there are 31,061 examples in which the estimated quotient will be the true quotient. There are 13,489 examples, then, in which the estimated quotient must be corrected in order to find the true quotient. It is evident that the need for correction is more easily determined in some estimations than in others. Hence, a classification of the divisors with respect to the ease of both estimation and correction of the estimated quotient will be an aid in determining the relative values of the apparent and the increase-by-one methods.

CLASSIFICATION OF ESTIMATIONS WHEN APPARENT METHOD IS USED

On the basis of the ease of estimation and of determination of the need for correction of the estimated quotient, the following six classifications may be made.

1. The quotient is self-evident, as in the example $24\overline{)26}$.

2. The estimated quotient is the true quotient, as in the example $24\overline{)50}$.

3. The true quotient is one less than the estimated figure, but the need for correction is evident, as in the example $24\overline{)65}$.

4. The true quotient is one less than the estimated figure, but the need for correction is not evident, as in the example $24\overline{)92}$.

[1] Foster E. Grossnickle, "How To Estimate the Quotient Figure in Long Division," *Elementary School Journal*, XXXII (December, 1931), 299–306.

5. The true quotient is two or more removed from the estimated quotient, as in the example $24\overline{)185}$.

6. The divisors are 13–18, inclusive.

The quotient is self-evident whenever the partial dividend is in the same decade as the divisor or when the former is in a lower decade than the latter. In the following example both estimations are self-evident.

$$\begin{array}{r} 10 \\ 36\overline{)384} \\ \underline{36} \\ 24 \end{array}$$

The relative size of the numbers is apparent, and the quotient is obtained intuitively without any formal estimation.

When the true quotient is one less than the estimated figure, as in the example $24\overline{)65}$, the need for correction is evident if there is no number to be carried from the tens' digit to the units' digit of the partial dividend. In the illustration given, the pupil estimates the number of 20's in 65 or the number of 2's in 6, depending on which use of the guide figure of the divisor is employed. In either case the estimated figure is 3. The pupil readily sees that three 4's will be greater than 5, and the estimated figure is made one less.

When a number must be carried from the tens' digit to that of the units' digit of the partial dividend, the need for correction is not self-evident. In the example $24\overline{)92}$, if the pupil estimates the number of 20's in 92 or the number of 2's in 9, he must consider the remainder of 12 in order to test the accuracy of the estimated quotient figure. This thought process is much more difficult than that necessary when there is no figure to be carried to the units' digit. Hence, the need for correction is not immediately evident when a figure must be carried to the units' digit of the partial dividend.

If the true quotient is two or more removed from the estimated figure, the need for making the estimated figure one less may or may not be evident, but the need for the second correction will be found only by comparison of the partial dividend and the product of divisor and quotient. Illustrations are given in Example A and Example B.

Example A	Example B
$24\overline{)185}$	$27\overline{)195}$

In Example A the estimated figure is 9, but, as the need for making the quotient one less is evident, the pupil tries 8. It is necessary, from the standpoint of economy in teaching examples of this type, for the pupil to compare the product of 8 and 24 with 185. After this comparison has been made, the trial quotient will be made one less, and the true quotient of 7 will be obtained. In Example B the need for making the estimated figure one less is not evident. In this case the pupil makes two comparisons of the partial dividend with the product of divisor and quotient. In a few cases the estimated figure may be three removed from the true quotient. In that event, at least two corrections will not be evident.

The sixth classification of divisors with respect to ease of estimation and of determination of the need for correction includes the divisors from 13 to 18, inclusive. Regardless of the method used for estimating the quotient figure, the pupil will experience difficulty in determining the correct quotient when the divisor is one of these six numbers. These divisors may be considered the *division demons*, as they occupy the same place in division that the "one hundred spelling demons" occupy in the field of spelling. In both subjects the demons must be given special consideration in order that pupils may reach satisfactory achievement.

If from the list of two-figure divisors are omitted the division demons and divisors having 9 in the units' place (because treatment of these two classes would be alike or equally difficult by both the apparent and the increase-by-one methods of estimating the quotient), the estimations for the remaining divisors may be classified according to the first five classifications previously given. The results for each divisor are given in Table I.

A summary of the data given in Table I gives the facts shown in Table II. From this table it is seen that about 20 per cent of the estimations made by the apparent method require correction when the need for this change is not immediately evident. Hence, in 80 per cent of the cases the estimated quotient is the true quotient or the need for correction is plainly evident. In any case in which an evident correction is to be made, the estimated figure is made one less.

TABLE I

CLASSIFICATION OF THE ESTIMATIONS OF THE QUOTIENT BY APPARENT METHOD FOR TWO-FIGURE DIVISORS, THE DIVISION DEMONS AND DIVISORS ENDING IN NINE BEING OMITTED

Divisor	Quotient Is Self-evident	Estimated Quotient Is True Quotient	True Quotient Is One Less and Correction Self-evident	True Quotient Is One Less and Correction Not Self-evident	True Quotient Is Two Removed	Total Requiring Estimation	Total Requiring Correction—Not Self-evident	Number of Examples Possible
11.....	20	46	44	0	0	90	0	110
12.....	20	24	56	8	12	100	20	120
21.....	30	136	44	0	0	180	0	210
22.....	30	102	68	20	0	190	20	220
23.....	30	73	70	52	5	200	57	230
24.....	30	58	56	72	24	210	96	240
25.....	30	50	45	75	50	220	125	250
26*....	30	46	36	70	76	230	148	260
27†....	30	43	31	66	89	240	166	270
28‡....	30	42	26	62	96	250	182	280
31.....	40	226	44	0	0	270	0	310
32.....	40	192	68	20	0	280	20	320
33.....	40	158	75	57	0	290	57	330
34.....	40	126	76	96	2	300	98	340
35.....	40	105	65	125	15	310	140	350
36.....	40	92	54	138	36	320	174	360
37.....	40	84	45	139	62	330	201	370
38.....	40	78	38	134	90	340	224	380
41.....	50	316	44	0	0	360	0	410
42.....	50	282	68	20	0	370	20	420
43.....	50	248	75	57	0	380	57	430
44.....	50	214	78	98	0	390	98	440
45.....	50	180	80	140	0	400	140	450
46.....	50	156	70	174	10	410	184	460
47.....	50	139	59	195	27	420	222	470
48.....	50	126	52	204	48	430	252	480
51.....	60	406	44	0	0	450	0	510
52.....	60	372	68	20	0	460	20	520
53.....	60	338	75	57	0	470	57	530
54.....	60	304	78	98	0	480	98	540
55.....	60	270	80	140	0	490	140	550
56.....	60	236	80	184	0	500	184	560
57.....	60	208	74	222	6	510	228	570
58.....	60	188	64	248	20	520	268	580
61.....	70	496	44	0	0	540	0	610
62.....	70	462	68	20	0	550	20	620
63.....	70	428	75	57	0	560	57	630
64.....	70	394	78	98	0	570	98	640
65.....	70	360	80	140	0	580	140	650
66.....	70	326	80	184	0	590	184	660

* When 26 is the divisor, there are two examples in which the estimated quotient is three removed from the true quotient.

† When 27 is the divisor, there are eleven examples in which the estimated quotient is three removed from the true quotient.

‡ When 28 is the divisor, there are twenty-four examples in which the estimated quotient is three removed from the true quotient.

TABLE I—*Continued*

Divisor	Quotient Is Self-evident	Estimated Quotient Is True Quotient	True Quotient Is One Less and Correction Self-evident	True Quotient Is One Less and Correction Not Self-evident	True Quotient Is Two Removed	Total Requiring Estimation	Total Requiring Correction—Not Self-evident	Number of Examples Possible
67.....	70	292	80	228	0	600	228	670
68.....	70	262	76	268	4	610	272	680
71.....	80	586	44	0	0	630	0	710
72.....	80	552	68	20	0	640	20	720
73.....	80	518	75	57	0	650	57	730
74.....	80	484	78	98	0	660	98	740
75.....	80	450	80	140	0	670	140	750
76.....	80	416	80	184	0	680	184	760
77.....	80	382	80	228	0	690	228	770
78.....	80	348	80	272	0	700	272	780
81.....	90	676	44	0	0	720	0	810
82.....	90	642	68	20	0	730	20	820
83.....	90	608	75	57	0	740	57	830
84.....	90	574	78	98	0	750	98	840
85.....	90	540	80	140	0	760	140	850
86.....	90	506	80	184	0	770	184	860
87.....	90	472	80	228	0	780	228	870
88.....	90	438	80	272	0	790	272	880
91.....	100	766	44	0	0	810	0	910
92.....	100	732	68	20	0	820	20	920
93.....	100	698	75	57	0	830	57	930
94.....	100	664	78	98	0	840	98	940
95.....	100	630	80	140	0	850	140	950
96.....	100	596	80	184	0	860	184	960
97.....	100	562	80	228	0	870	228	970
98.....	100	528	80	272	0	880	272	980
Total.	4,200	22,052	4,366	6,983	672	34,110	7,692	38,310

In the group of 709 examples in which the true quotient is two or more removed from the estimated figure, there are 37 examples in which the true quotient is three removed from the estimated quotient. In the latter group the pupil will try one less to find the true quotient because the need for correction is evident. Of the remaining 672 examples of the group, 282 require a correction of one less because it is evident that the estimated figure is too large. Hence, there are only 390 examples in which the estimated quotient is two removed from the apparent quotient and the need for correction is not evident.

The pedagogical significance of the group of 7,692 examples in which the true quotient is not the apparent quotient and in which the

need for correction is not evident cannot be treated lightly. It is this group of division examples that needs to be given major consid-

TABLE II

SUMMARY OF CLASSIFICATION OF ESTIMATIONS OF QUOTIENT BY APPARENT METHOD, THE DIVISION DEMONS AND DIVISORS ENDING IN NINE BEING OMITTED

Classification	Number of Possible Examples	Per Cent
1. Quotient is self-evident	4,200	10.96
2. Estimated quotient is true quotient	22,052	57.56
3. True quotient is one less than estimated quotient, but need for correction is evident	4,366	11.40
4. True quotient is one less than estimated quotient, but need for correction is not evident	6,983	18.23
5. True quotient is two or more removed from estimated quotient	709	1.85
6. Total requiring estimation (sum of 2, 3, 4, and 5)	34,110	89.04
7. Total requiring correction not evident (sum of 4 and 5)	7,692	20.08
8. Total number of examples (sum of 1 and 6)	38,310	100.00

eration by the teacher and by the textbook-writer in order that the practice materials provided for the pupils may be adequate to assure mastery of the process.

CLASSIFICATIONS OF ESTIMATIONS WHEN INCREASE-BY-ONE METHOD IS USED

In the increase-by-one method, when the units' figure of the divisor is 6 or more, the tens' digit is increased by one. Since the apparent method as used in this study is the same as the increase-by-one method for divisors ending in 9, the latter method is different only in the case of divisors ending in 6, 7, and 8. The classification for these divisors includes the following types.

1. The quotient is self-evident, as in the example $26\overline{)281}$.
2. The estimated quotient is the true quotient, as in the example $26\overline{)62}$.
3. The true quotient is one more than the estimated figure, as in the example $26\overline{)82}$.
4. The true quotient is two more than the estimated figure, as in the example $26\overline{)235}$.
5. The divisor is a division demon, as in the example $16\overline{)142}$.

The quotient is self-evident whenever the partial dividend is in the same or a lower decade than the divisor. In this respect the two methods are identical.

If the estimated quotient in the increase-by-one method is not the true quotient, the correction is made by increasing the quotient figure by one, and in some cases by two, for divisors with a units' figure of 6 to 9, inclusive. When this method is used, the need for correction cannot be self-evident except when the divisor ends in 9. For this reason the writer in his earlier article recommended that the same procedure should be used in both methods for divisors ending in 9. If the divisor ends in 6, 7, or 8, the test for accuracy of the estimated quotient cannot be made in the increase-by-one method except by comparing the product of the divisor and the quotient with the partial dividend because of the intricacy of the thought process involved in trying to make a mental test of the validity of the estimated quotient. The following five steps are involved in making a test for the accuracy of the estimated figure.

1. Subtract the actual divisor from the trial divisor.
2. Multiply the remainder in Step 1 by one more than the estimated quotient.
3. Subtract the partial dividend from the product of the trial divisor and one more than the estimated quotient.
4. Compare product in Step 2 with remainder in Step 3.
5. Increase the estimated quotient by one when the product in Step 2 is *equal to*, or *greater than*, the remainder in Step 3; if the product in Step 2 is *less than* the remainder in Step 3, write the estimated figure for the quotient.

This thought process may be verified by considering the example $37\overline{)150}$. The pupil estimates the number of 40's in 150 to be 3. Then he increases this estimation by one and tries 4. Then he finds the product of 4 and 40, or 160. The partial dividend is subtracted from 160, giving a remainder of 10. The difference between the divisor and the trial divisor is 3, and four times this amount is 12. Since this product is greater than 10, the true quotient is 4 instead of 3. This complex thought process shows that it is impossible to have an estimated figure which is not the true quotient and yet have the need for correction self-evident. The only exception to this rule occurs when the divisor ends in 9. Hence, when the units' figure is 6, 7, or 8, all corrections which need to be made can be found only by comparing the product of the divisor and the estimated quotient with the partial dividend. The complete classification for the divisors ending in 6, 7, and 8 is given in Table III.

If the apparent method is used, the accuracy of the estimated figure may be tested without actually computing the product of the divisor and the estimated quotient and subsequently comparing that product with the partial dividend. The thought pattern to be followed in that case was described in an earlier article.[1]

TABLE III

CLASSIFICATION OF ESTIMATIONS FOR TWO-FIGURE DIVISORS ENDING IN 6, 7, AND 8 WHEN INCREASE-BY-ONE METHOD OF ESTIMATING QUOTIENT IS USED, THE DIVISION DEMONS BEING OMITTED

Divisor	Quotient Is Self-evident	Estimated Quotient Is True Quotient	True Quotient Is One More	True Quotient Is Two More	Number of Possible Examples
26	30	72	150	8	260
27	30	108	132	0	270
28	30	162	88	0	280
36	40	144	176	0	360
37	40	198	132	0	370
38	40	252	88	0	380
46	50	234	176	0	460
47	50	288	132	0	470
48	50	342	88	0	480
56	60	324	176	0	560
57	60	378	132	0	570
58	60	432	88	0	580
66	70	414	176	0	660
67	70	468	132	0	670
68	70	522	88	0	680
76	80	504	176	0	760
77	80	558	132	0	770
78	80	612	88	0	780
86	90	594	176	0	860
87	90	648	132	0	870
88	90	702	88	0	880
96	100	684	176	0	960
97	100	738	132	0	970
98	100	792	88	0	980
Total	1,560	10,170	3,142	8	14,880

The group composing the division demons will be the same in both methods of estimation.

From Tables I and III a summary table may be made for the estimations obtained by the use of the increase-by-one method. This summary is given in Table IV. This table indicates that, when the increase-by-one method is used, in approximately 85 per cent of the

[1] Foster E. Grossnickle, "How To Test the Accuracy of the Estimated Quotient Figure," *Elementary School Journal*, XXXII (February, 1932), 442–46.

total number of examples the estimated quotient is the true quotient or the need for correction is immediately evident. This percentage is obtained by combining Items 1, 2, and 5 in Table IV. Thus, in 15 per cent of the examples the estimated figure requires correction when the need for this correction is not immediately evident. In about 8 per cent of the examples the estimated figure must be increased, and in about 7 per cent the estimated figure must be decreased.

If the apparent method is used, in approximately 80 per cent of the cases the estimated figure is the true quotient or, if not, the need

TABLE IV

SUMMARY OF CLASSIFICATION OF ESTIMATIONS OF QUOTIENT BY INCREASE-BY-ONE METHOD

Classification	Number of Possible Examples	Per Cent
1. Quotient is self-evident	4,200	10.96
2. Estimated quotient is true quotient	25,656	66.98
3. True quotient is one more than estimated quotient	3,142	8.20
4. True quotient is two more than estimated quotient	8	0.02
5. True quotient is one less than estimated quotient, but need for correction is evident	2,781	7.26
6. True quotient is one less than estimated quotient, but need for correction is not evident	2,415	6.30
7. True quotient is two less than estimated quotient	108	0.28
8. Total requiring correction which is not evident (sum of 3, 4, 6, and 7)	5,673	14.81
9. Total number of examples	38,310	100.00

for finding the true quotient by reducing the estimated figure by one is self-evident. Hence, in about 20 per cent of the cases, the estimated figure must be changed to find the correct quotient when the need for this correction is not evident. Therefore, the difference in the percentages of estimations which require correction in the two methods when the need for correction is not self-evident is only 5. This slight advantage goes to the increase-by-one method, but it is counteracted by the fact that the pupil must learn two techniques for making the correction. In the apparent method only one process must be applied. In the case of divisors ending in 9, which are increased to the next decade number, the need for correction is self-

evident; hence, no new technique must be learned for determining the need of rectifying an incorrect estimation.

These data lead to the conclusion that the apparent method is almost as accurate as the increase-by-one procedure. (It is understood that divisors ending in 9 are treated as special cases and are increased to the next decade number.) In the increase-by-one method it is evident that, if an incorrect quotient figure is obtained, two distinct procedures must be learned for making the necessary corrections to find the true quotient figure. It may be necessary to make the estimated figure two more or two less. Since only one method must be learned for rectifying an incorrectly estimated figure in the apparent method (decreasing the estimated figure), the advantage for the learner which exists between the two methods seems to favor the apparent method.

COMPARATIVE ACHIEVEMENT IN WORD RECOGNITION UNDER TWO METHODS OF TEACHING BEGINNING READING

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During the decade 1920–30 two distinctly different methods of teaching beginning reading were developed in Detroit. In 1920 the first edition of *Picture-Story Reading Lessons*[1] was put into experimental use in four elementary schools, and some seven years later a method which has come to be known as the "Visual method"[2] was given an experimental tryout in the O. W. Holmes School. During these seven years the Picture-Story method had been modified, extended, and finally adopted for city-wide use with Detroit's first-grade children. By the autumn of 1929 the Visual method had also experienced a certain amount of revision, was in use as such in the low-first grade in four schools and in the high-first grade in one school, and gave promise of expanding its field of activity. It was thought advisable, however, before the new plan should be extended further in Detroit, to secure "objective and impartial evidence of the merit of the procedures"[3] which were being used in low-first grade.

This report presents (1) a brief description of the two contrasted methods, (2) a statement of the delimited problem dealt with in the experiment, (3) the experimental set-up, (4) a report of an investi-

[1] Developed and later published by Nila Banton Smith, under the direction of Stuart A. Courtis, *Picture-Story Reading Lessons*. Yonkers-on-Hudson, New York: World Book Co., 1924.

[2] Developed and later published by Mildred S. Smith, Florence E. Bergstrom, and Walter E. Dixon, *Keystone Visual Readers*. Meadville, Pennsylvania: Keystone View Co., 1929.

[3] Minutes of the Instructional Council, Detroit Public Schools, December 5, 1929.

gation into the impartiality of the tests used, and (5) the test results and final conclusions from the experiment.

THE TWO CONTRASTED METHODS

The two reading methods may be contrasted with respect to numerous points. An understanding of the more important of these is essential to a just and fair interpretation of the experiment.

Objectives.—According to the manual provided teachers using the Visual method, a child who completes the work of the first semester in reading is expected to have achieved certain definite objectives and to have developed certain specific abilities, namely:

1. Ability to recognize about three hundred words
   a) As independent words
   b) In phrases or thought units
   c) In context
2. Ability to match words
   a) Script form with script
   b) Print form with print
   c) Script form with print
3. Ability to interpret subject matter as shown by
   a) Retelling the story
   b) Answering comprehension questions
   c) Following directions
   d) Carrying out seat-work assignments
   e) Dramatization
4. Ability to discover words and meanings through
   a) Use of blackboard dictionary
   b) Use of reading charts
5. Ability to progress independently through
   a) Individual progress stories provided in the reader
   b) Provision for independent reading of other books[1]

According to the manual provided the teachers who use *Picture-Story Reading Lessons*, the most important objectives which this method seeks to attain through its procedures are:

1. To develop the child's power to purpose through reading situations.
2. To enable him to use his reading ability as a *tool* in carrying out his purposes from the time of his first contact with the activity.
3. To provide some means whereby the child may largely teach himself in learning to read.

[1] Mildred S. Smith, Florence E. Bergstrom, and Walter E. Dixon, *Teachers Manual for Book I and Book II of the Keystone Visual Readers*, p. 65. Meadville, Pennsylvania: Keystone View Co., 1931.

4. To permit each child to progress as rapidly as his individual effort and ability will permit.

At least a score of other aims were constantly kept in mind throughout the preparation of the material. But the ones mentioned above, *purposing*, *reading as a tool*, *self-helpfulness*, and *individual progression*, are the four corner stones upon which the method was built.[1]

Thus, it will be observed that, whereas the authors of the Visual method make the development of ability in reading an end in itself, the authors of the Picture-Story method see in reading a means to another goal—character-building. The Visual method endeavors to assure the achievement of specific "reading abilities" by frontal attack. The Picture-Story method prefers to work directly for growth in "personality, character, and intellectual power"[2] and expects the development of ability in reading to occur, but as a by-product.

Procedures and materials.—The Visual method is apparently named from its use of stereographs and the stereopticon.

The lessons are presented by the use of objects, stereographs, and lantern slides which are especially adapted to the stories introduced. The stereograph is first used in a conversational period, during which the pupil's attention is focused upon the words to be presented. A lantern slide of the same picture is then projected upon the blackboard, and upon it are written the names of those objects that are to be taught. . . . .

By the use of flash cards or lantern slides, these words are drilled upon and recognized in sentences and paragraphs. . . . . After the first nine stories, or units, have been mastered, the book is used to provide supplementary stories, giving frequent review of words previously taught, as well as providing for the introduction of new words.[3]

In the first few weeks of work the Visual method requires that the children be handled in groups. Later on certain provisions are made for pupils to progress at different rates. A drawing-book is furnished in addition to the primer and provides "seat-work directions" for the "immediate use of the new words in a purposeful manner."[4] The main teacher activity in the classroom, however, continues to

[1] Nila Banton Smith, under the direction of Stuart A. Courtis, *Teacher's Manual, Picture-Story Reading Lessons*, Series I, p. 6. Yonkers-on-Hudson, New York: World Book Co., 1926 (revised).

[2] *Ibid.*, p. xii.

[3] Mildred S. Smith, Florence E. Bergstrom, and Walter E. Dixon, *op. cit.*, p. 2.

[4] *Ibid.*, p. 5.

be the instruction of children in groups. Thus, the *Teachers Manual* directs:

> As soon as individual differences in ability become apparent, pupils should be divided into two or more groups. Group I is composed of those children who seem to have mastered the work thus far and are capable of going forward on new lessons. Group II is composed of those children who, for some reason, have failed to grasp all the work presented and need further drill. Group II may be given a thorough review before proceeding with new lessons.[1]

The Picture-Story method apparently takes its name from the way in which the pupil's purpose to build pictures becomes an integral step to his development of power to read stories. Each child is provided with a practice pad of "picture frames," cut-outs, and directions, a dictionary, a copy of the reader entitled *My Story Book*, and a large envelope in which to keep his materials.

> On this picture frame is printed a background in which the important objects are omitted and in their places are printed their names. The cut-outs are composed of a series of printed figures to be cut out, colored, and pasted on the frame to make a completed picture. . . . .
>
> It is reasonably safe to assume that in every little child there exists an innate love for cutting, coloring, and pasting. . . . . When he sees the frame and the cut-outs arrayed before him, there is aroused within him the desire to construct the completed picture, and he is willing to carry on any activity which will aid him in attaining this end. The activity involved is learning to read a set of directions in which he is given instructions for cutting, coloring, and placing the various figures in the frame.[2]

In the introductory lessons the pupils are dealt with as a group much as are pupils under the Visual method. Through stories, dramatization, the drawing of pictures, and the use of "labels," the pupils begin to acquire a minimum basic vocabulary. Gradually, as individual children reach a level of maturity in the manipulation of materials which assures the teacher that they are able to "go it alone" with the individualized Picture-Story lessons, they are placed in a so-called "independent group." Here each child works ahead independently in the activities which are suggested in the lessons. It is through the use of written language as a means for the completion of these activities that the child acquires as a by-product the ability to read.

One of the outstanding differences between the two methods of

[1] Mildred S. Smith, Florence E. Bergstrom, and Walter E. Dixon, *op. cit.*, pp. 3–4.
[2] Nila Banton Smith, under the direction of Stuart A. Courtis, *op. cit.*, pp. 7–8.

teaching reading is thus seen to be the degree to which they organize the activities of the classroom in ways that facilitate individual progress. In the one plan the special equipment used encourages the continuance of a large amount of group instruction throughout the semester. In the other plan the materials provided encourage the early abandonment of group instruction for the pursuit of goals the attainment of which increasingly involves the use of written language in a necessarily individual situation.

Vocabularies.—Comparison of achievement in the early stages of learning to read is intimately dependent on the vocabularies developed. The statements found in the manuals of the two contrasted reading methods would lead one to expect that there would be much in common between the vocabularies used. The manual of the Visual method reports that its vocabulary is selected from Thorndike's list and from lists compiled by Horn, Gates, and others. The vocabulary of the Picture-Story materials is "composed of words having the highest frequency in the Thorndike word list together with words having the highest frequency in ten common primers but not occurring in the Thorndike list."[1] By actual count the overlapping between the two vocabularies is not large. Of the 340 different words found in the Visual-method materials and the 314 words which constitute the Picture-Story vocabulary, only 170 are common to the two.

THE PROBLEM OF THE EXPERIMENT

The measurement of the relative effectiveness of two reading methods essentially different in the goals they strive to achieve presents a difficult problem. No tests available at the time seemed to be adequate for the measurement of progress toward certain of their objectives. The utter divergence of most of these objectives further complicated the problem.

In one element, however, the plans are alike. Each grants that the ability of children to recognize words of selected vocabularies should be well advanced before the end of the first semester of training. Further, they agree in roughly half the words they actually teach. Instruments are available for the measurement of recognition of words that are selected rather largely from just the field in

[1] Nila Banton Smith, under the direction of Stuart A. Courtis, *op. cit.*, p. 9.

which the two methods agree. Consequently, it seemed necessary to delimit the broader problem of measuring the relative effectiveness of the two plans *in toto* to the measurement of *comparative achievement in word recognition* under the two methods.

THE EXPERIMENTAL SET-UP

Of the four schools in Detroit using the Visual method at the opening of the second semester in 1929–30, three were selected for inclusion in the experiment. These three schools were matched with three others in which the Picture-Story method was in use. Care was exercised that all the classes included in the experiment were beginners in reading, that the nationality and socio-economic conditions of the neighborhoods from which the schools drew their populations were comparable, that the types of school organizations existing in the matched schools were the same, and that the pupils used in the final analysis were closely alike in age and general brightness.

After three schools had been selected matching the schools using the Visual method in these particulars, teachers were selected who exactly matched in terms of the last official principals' ratings the three teachers of the Visual-method classes. In order that general quality and quantity of instruction might be even more closely equated, carefully devised regulations were put in force covering the length of class period, outside practice in reading by pupils, and the preparation of supplementary instructional materials.

As far as possible during the course of the experiment, all factors which might tend either to hamper or to stimulate learning in unusual ways were subjected to strict regulation. All questions concerning the administration of the experiment were handled by the Department of Research, which acted as the articulating agent between the teachers and the supervisors during the experiment.

One very definite modification of the Picture-Story method was made in order to equalize the courses of study under the two plans. Because the Visual method taught both script and print, teachers of the Picture-Story method were asked to do the same. In all other respects both methods were followed in the regular way.

The experiment proper began with the opening of the second semester, in February, 1930, and continued for eighteen weeks.

THE TESTS USED

During the second, eighth, thirteenth, and eighteenth weeks of school, a series of tests was given to each pupil in the six classes included in the experiment. At each testing time two forms of the Detroit Reading Test 1[1] and one form of Detroit Reading Test 7[2] were given. The actual testing time devoted in each testing program to Reading Test 1 was eight minutes; to Reading Test 7, four minutes for Part I and an indeterminate time, usually not more than fifteen or twenty minutes, for Part II.

In content the two tests are somewhat different. Reading Test 1 was constructed before the adoption of the Picture-Story method in Detroit and was designed to measure the instructional product of a reading method which is no longer generally used in Detroit. The vocabulary used in its construction consisted of words which are found in the first five hundred in *The Teacher's Word Book*[3] and which also had a rather high frequency of occurrence in ten first-grade readers which were then in use in Detroit.[4] On the other hand, Detroit Reading Test 7 was designed specifically for use with the Picture-Story materials. It contains only words which are to be found in either Series I or Series II of *Picture-Story Reading Lessons*,[5] and the words are arranged in the test in the order in which they occur in the lessons.

As a result of the definite relation existing between the vocabulary of Reading Test 7 and the vocabulary of the Picture-Story method, it might be assumed that Reading Test 7 would be prejudiced *against* the Visual method. This assumption, combined with the uncertain relation between the vocabularies of the contrasted reading

[1] Known locally by the designation given but published commercially as Detroit Word Recognition Test, by Eliza M. Oglesby. Yonkers-on-Hudson, New York: World Book Co., 1925.

[2] Paul T. Rankin, Detroit Beginning Reading Test, Test 7. Detroit, Michigan: Board of Education.

[3] Edward L. Thorndike, *The Teacher's Word Book*. New York: Teachers College, Columbia University, 1921.

[4] Eliza F. Oglesby, "A First-Grade Reading Test," *Journal of Educational Research*, X (June, 1924), 29–41.

[5] Series I provides approximately a first semester's work in reading for the average child; Series II, a second semester's work for pupils who have completed Series I.

methods and the vocabulary of Test 1, seemed to necessitate an analysis of the relative fairness of these two tests for the reading methods under consideration.

In the first step in the analysis all the materials used by the children themselves under the two methods were subjected to a word count. A standard procedure was established for the word analysis and was used with all materials of both methods.[1] The results are shown in Table I. It will be noted that, while the number of different words included in the vocabularies of the two plans is nearly

TABLE I

SUMMARY OF VOCABULARY ANALYSIS OF CONTRASTED READING MATERIALS*

	Picture-Story Materials	Visual-Method Materials
Number of words in running count	5,285	6,986
Number of different words	314	340
100-per-cent words:		
Number of different words	111	213
Percentage of total vocabulary	35	63

* The differences between the total vocabularies reported here and the totals reported by the publishers are no doubt mainly due to differences in the rules observed in making the word counts.

the same, the percentage of the vocabulary which is placed in a so-called "100-per-cent word" classification is considerably greater under the Visual plan than under the Picture-Story method. The stress which teachers are expected to place on "100-per-cent words" is indicated by the following quotation from the manual of the Visual method. "As soon as the story has been completed . . . . it is very important to test every pupil to see that he has mastered the 100-per-cent words of the story. . . . . The testing of the individual on the recognition of 100-per-cent words is the most important step of the whole procedure."[2]

In the next step of the analysis of the relative fairness of the two tests, the vocabularies actually included in the forms of the tests used were compared with the vocabularies of the contrasted

[1] Most of the rules which were observed were adapted from those reported in a study by Erich Selke and G. A. Selke, "A Study of the Vocabularies of Beginning Books in Twelve Reading Methods," *Elementary School Journal*, XXII (June, 1922), 745–49.

[2] Mildred S. Smith, Florence E. Bergstrom, and Walter E. Dixon, *op. cit.*, pp. 10–11.

reading materials.[1] A summary of this analysis is given in Table II. It will be noted that, of the words used in Test 1, practically equal numbers are found in the vocabularies of the two reading methods. Thus, children under the two plans had practically equal "opportunity to score" if it may be assumed that a child who has finished eighteen weeks of work under either plan may be expected to recognize words which are found in his reading materials. However, it will be observed that, of the 64 test words which are found in the Picture-Story vocabulary, 47 (73 per cent) are words which receive

TABLE II

ANALYSIS OF RELATIVE FAIRNESS OF FINAL FORMS OF DETROIT READING TEST 1 AND DETROIT READING TEST 7 WITH RESPECT TO TWO CONTRASTED READING METHODS

	Test 1		Test 7	
	Number	Per Cent	Number	Per Cent
Different words in test	87	.....	103	.....
Test words occurring in reading materials:				
Picture-Story method	64	74	88	85
Visual method	65	75	70	68
Tested words-in-vocabulary which are classified as 100-per-cent-words:				
Picture-Story method	47	73	56	64
Visual method	57	88	62	89

special instructional emphasis as 100-per-cent words, whereas 57 of the 65 test words found in the Visual vocabulary (88 per cent) are words which are stressed. If "opportunity to score," as measured by occurrence-in-vocabulary of words included in the test, is nearly the same and "instructional emphasis," as measured by the percentage of the tested words-in-vocabulary which are classified as 100-per-cent words, is clearly unequal, the judgment seems fairly drawn that, if advantage existed for either method in the use of Test 1, it must have been in favor of the Visual method.

With respect to Test 7, however, the story is different. "Opportunity to score" on this test clearly favors the pupils who worked

[1] While the study was carried through for the initial forms with the identical procedures employed with the final forms, later evidence shows that the two experimental groups were so evenly matched on the initial tests and their scores were so low that any differences discovered in the relation between initial-test vocabulary and the vocabularies of the two reading methods are obviously of little meaning.

under the Picture-Story method. If "instructional emphasis" is considered, however, the relation is reversed. How these two factors, "opportunity to score" and "instructional emphasis," should be weighted in making a summary judgment of the relative fairness of Test 7 is a difficult question. Consensus of opinion seems to be that they should be weighted about equally. If this is the case, Test 7, while also slightly biased in favor of the Visual method, is apparently the fairer of the two measures used in the experiment.

THE RESULTS OF MEASUREMENT

The pupils whose scores were used in the final analysis were closely matched, as has been indicated above, on the bases of grade, age, and intelligence rating. That the two groups were closely matched in their initial mean scores is indicated by Table III.

TABLE III

INITIAL STATUS OF CONTRASTED GROUPS ON TWO DETROIT READING TESTS

METHOD	NUMBER OF CASES	INITIAL MEAN SCORES	
		Test 1	Test 7
Picture-Story.....	42	5.9	7.1
Visual.....	60	6.8	7.6

As has been indicated earlier, four sets of tests were administered to all groups of pupils included in the experiment. The purpose of so elaborate a testing program was to determine whether differences in the rate of development were to be found in the two plans during various periods in the semester. In general, it was found that on Test 1 gains made by pupils under the Visual method were larger on all tests given during the semester than those made by pupils under the Picture-Story method. On Test 7 the relationship was reversed. Here the differences were just as consistently in favor of the Picture-Story method.

The comparison of gains between the initial and final testings is given in Table IV. These initial-final comparisons corroborate the findings for shorter intervals during the semester. On Test 1 the gain of the Visual method is larger than that of Picture-Story. The

difference in gain is found to be statistically "probable."[1] On Test 7 Picture-Story's gain is greater than that of the Visual method, by an amount which is statistically "certain."

In addition to the statistical reliability of the differences, it is important to discover the educational importance of these differences. This phase may be studied by reference to the mean gains made by the combined Visual and Picture-Story groups between the initial and final testings. The superiority of the Visual-method pupils on Test 1 after an interval of sixteen weeks of instruction is 4.8

TABLE IV

COMPARISON OF GAINS IN SCORES MADE ON FINAL TEST OVER SCORES MADE IN INITIAL TEST

	Test 1	Test 7
Gain:		
Picture-Story method.....	34.2	25.7
Visual method.....	39.0	18.7
Difference in gains:*		
Units of original score.....	− 4.8	7.0
Units of standard deviation of difference in gain.....	− 2.1	6.4

* Negative differences are in favor of the Visual method; positive, in favor of the Picture-Story method.

points, or somewhat more than 10 per cent of the average growth made by the pupils of the combined groups during the sixteen-week interval. On Test 7 the superiority of the Picture-Story method over the Visual method is 7.0 points, or more than 30 per cent of the average gain made by the combined groups.

CONCLUSIONS

On the basis of the evidence displayed in the foregoing tables, the following conclusions seem to be warranted.

1. The Visual method is "probably" superior to the Picture-Story method in the development of power to recognize words as measured by Detroit Reading Test 1, a test which analysis shows is biased in favor of the Visual method.

[1] The measure of statistical reliability used in this analysis was the quotient of the "difference in gain" divided by the "standard deviation of the difference in gain." The so-called "long" formula for this latter measure (involving the coefficient of correlation) was used in every instance.

2. The Picture-Story method is "certainly" superior to the Visual method in the development of power to recognize words as measured by Detroit Reading Test 7, a test which analysis shows to be fair to the two reading methods.

3. If, in order that an indication of the educational importance of a difference in gain may be secured, the difference is referred to the average semester gain of the combined groups as a standard, the superiority of the Visual-method group on Test 1 is found to be one-third as much as the superiority of the Picture-Story group on Test 7. Thus, it would appear that, of these two comparisons, the superiority of the Picture-Story method over the Visual method is more surely of educational importance.

In summary, the evidence from this experiment indicates that, under testing conditions slightly favorable to the Visual method, its superiority in *growth in power to recognize words* was statistically not of particularly high reliability and educationally of questionable importance. Under conditions thought to be more nearly fair to the two methods, the superiority of the Picture-Story method of instruction in the development of this particular power was statistically of high reliability and educationally probably of considerable importance.

It must be recognized in the end, however, that no evidence has been presented in this study bearing on the relative effectiveness of the two methods in attaining objectives other than this one—growth in achievement in word recognition. That numerous other important objectives need to be considered before forming a single summary judgment of the effectiveness of any particular reading method would no doubt be upheld, not only by the authors of the two methods under consideration here, but by all recognized authorities in the field. A review of the objectives of reading instruction as formulated in the *Report of the National Committee on Reading*[1] supports this assertion. Consequently, in all fairness to the Visual and the Picture-Story methods, it may well be reiterated that the present study has involved only the question of comparative achievement in word recognition under the two contrasted methods of teaching beginning reading.

[1] *Report of the National Committee on Reading*, pp. 9–19. Twenty-fourth Yearbook of the National Society for the Study of Education, Part I. Bloomington, Illinois: Public School Publishing Co., 1925.

THE ADAPTABILITY OF PUPILS TO MANUSCRIPT WRITING

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Many school superintendents are interested in introducing manuscript writing into their schools, but they frequently hesitate for fear that the sudden change from cursive writing to manuscript writing will be detrimental to the child's writing performance. Those who must assume the responsibility of recommending the change to manuscript writing wonder whether or not a stage of confusion will be produced in the child so that he can do neither manuscript nor cursive writing. The problem was especially acute in Shaker Heights, a rapidly growing suburb of Cleveland, where there is an increase in the school population of approximately five hundred pupils a year. The teachers and staff were not only disturbed over the possible effect incident to the wholesale adoption of manuscript writing on the current school population but were equally interested in the effect on the handwriting of those pupils who would be continuously entering the system from other schools in which only cursive writing was taught.

No conclusive experimental data on this problem were found. The staff, however, decided to drop cursive writing and adopt manuscript writing in Grades I–VI, inclusive. This change was initiated through a series of teachers' meetings and class demonstrations by experts in manuscript writing. After manuscript writing had been taught for three and one-half years, a complete survey was made in December, 1929, to determine the success of the handwriting program. The data from this survey permitted the formulation of an answer to the original problem of the effect on the child's performance of changing from cursive writing to manuscript writing. This article presents this particular aspect of the survey results.

The survey was carried on by the research department under

standardized conditions and procedures. Each paper was marked on the number of letters written a minute and on the quality of writing as determined by the average of three independent judgments based on the Conard scale.

TABLE I

AVERAGE NUMBER OF LETTERS A MINUTE WRITTEN BY PUPILS IN GRADES VI B AND VI A AFTER VARIOUS AMOUNTS OF TRAINING IN MANUSCRIPT WRITING

Number of Years of Training	Grade VI B	Grade VI A
0.0	45.9	39.7
0.5	54.2	47.6
1.0	45.7	59.2
1.5	49.2	59.2
2.0	44.6	54.9
2.5	54.1	58.5
3.0	47.3	55.4
3.5	50.6	58.4

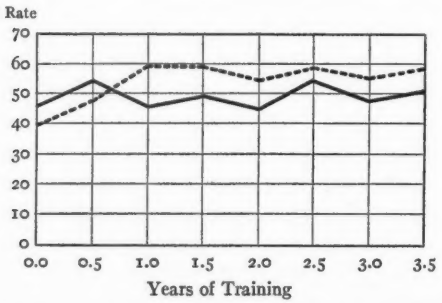

FIG. 1.—Rates in manuscript writing achieved by pupils in Grade VI B (unbroken line) and in Grade VI A (broken line) after various amounts of training.

Table I and Figure 1 show the rapidity with which a pupil may acquire a reasonable rate in manuscript writing. In this figure Grades VI A and VI B remain constant while the number of years of training in manuscript writing varies. The pupils in Grade VI B who because they had just entered the system had had no training (two months or less) in manuscript writing wrote an average of 45.9 letters a minute. The pupils in the same grade who had had 3.5 years of training in manuscript writing made an average rate of only

50.6 letters a minute. A similar situation holds for Grade VI A. This condition is not to be interpreted as an indication of slowness on the part of pupils who have had the maximum training but as an indication of the rapidity with which a child develops a desirable rate in manuscript writing.

TABLE II

AVERAGE SCORES ON CONARD SCALE OF QUALITY MADE BY PUPILS IN GRADES IV B AND V A AFTER VARYING AMOUNTS OF TRAINING IN MANUSCRIPT WRITING

Number of Years of Training	Grade IV B	Grade V A
0.0	26.0	53.0
0.5	33.9	56.1
1.0	39.0	58.7
1.5	40.0	61.1
2.0	41.8	63.1
2.5	41.6	59.0
3.0	40.3	64.4
3.5	42.2	64.7

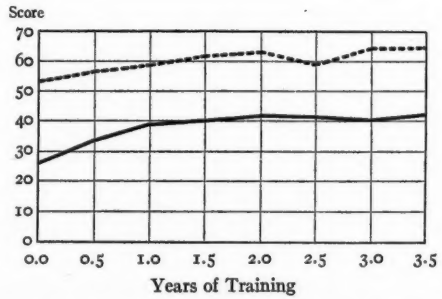

FIG. 2.—Average scores on quality of writing achieved by pupils in Grade IV B (unbroken line) and Grade V A (broken line) after various amounts of training.

The pupils likewise made rapid gains in the quality of their performance, as is shown in Table II and Figure 2. Pupils in Grade IV B who had had no training in manuscript writing secured average scores for quality on the Conard scale of 26. After three years of training in manuscript writing, the average score on quality was 40.3. The difference between these scores becomes significant when the difference in length of training is taken into consideration.

In Table III and Figure 3 the grades vary while the amount of training remains constant. Pupils in Grade I B who had had one-half year of training in manuscript writing made an average rate of 10.5 letters a minute while those pupils in Grade VI B who had had

TABLE III

AVERAGE NUMBER OF LETTERS A MINUTE WRITTEN BY PUPILS IN GRADES I B–VI B AFTER ONE-HALF YEAR OF TRAINING IN MANUSCRIPT WRITING

Grade	Average Number of Letters a Minute
I B	10.5
I A	18.8
II B	22.9
II A	24.3
III B	29.0
III A	32.6
IV B	41.2
IV A	42.0
V B	45.8
V A	45.1
VI B	54.2

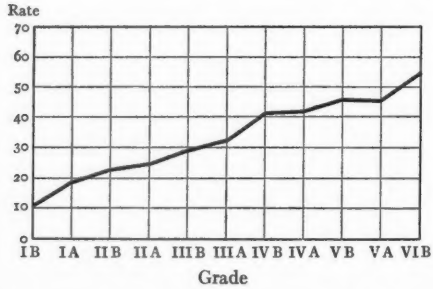

FIG. 3.—Rates in manuscript writing achieved by pupils in Grades I B–VI B after one-half year of training.

an identical amount of training wrote at a rate of 54.2 letters a minute. Table IV and Figure 4 illustrate the same general effect of maturity on the quality of manuscript writing. The pupils in Grade IV B who had had one-half year of training in manuscript writing made an average score of 33.9 on the Conard scale of quality,

while those in Grade VI A with the same amount of training made an average score of 61.

The data presented seem to warrant the conclusion that, with previous training in cursive writing plus a general maturity result-

TABLE IV

AVERAGE SCORES ON CONARD SCALE OF QUALITY ACHIEVED BY PUPILS IN GRADES IV B–VII B AFTER ONE-HALF YEAR OF TRAINING IN MANUSCRIPT WRITING

Grade	Average Score
IV B	33.9
IV A	35.5
V B	52.8
V A	56.1
VI B	61.8
VI A	61.0
VII B	69.0

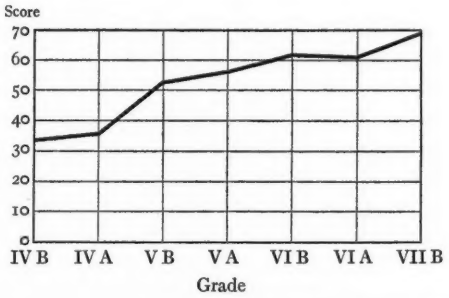

FIG. 4.—Average scores on quality of writing achieved by pupils in Grades IV B–VII B after one-half year of training in manuscript writing.

ing in increased muscular control and co-ordination, a child can readily acquire a reasonable quality and rate in manuscript writing. This level of performance is rapidly reached at any period of maturity. A superintendent, therefore, may transfer a child from cursive writing to manuscript writing with the assurance that the pupil will quickly and readily acquire an acceptable standard of performance in manuscript writing.

It should be pointed out, however, that in other investigations[1] the evidence indicates that children in the second and third grades are able to transfer to manuscript writing more readily than at a later age. It should be pointed out, too, that the evidence with respect to the relative merits of cursive and manuscript writing is somewhat conflicting, the weight of the evidence seeming to indicate that beyond the fifth or sixth grades the cursive form is somewhat superior.

[1] Frank N. Freeman, "Handwriting," *Psychology of the School Subjects*, pp. 337–40. Review of Educational Research, Vol. I, No. 5. Washington: American Educational Research Association, 1931.

MORE ADO ABOUT ZERO

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A recent article in the *Elementary School Journal* begins with the statement that "the zero integer is one of the great arithmetic trouble-makers in the elementary school"[1] and concludes with a description of methods of teaching four uses of the zero as an integer. The reader gathers from the article that the zero is used in combinations like the other symbols in the Hindu-Arabic system and that learning the zero combinations must precede the proper use of the zero. No distinction is made between the actual use of the zero in elementary arithmetic and the apparent use.

It does appear that the zero is used like the rest of the symbols. The zero is written in all sorts of combinations; hence, it is easy to conclude that the zero is the same kind of symbol as the other integers and that it is used as are the others. When the Hindu-Arabic numerals were introduced into Western Europe, they were distinguished by the masses by their most characteristic feature. No other system of numerals employed a zero. The zero was an interesting and striking peculiarity of the new system. The name for the zero came to be used to describe the use of the whole system; "to cipher" meant to use the system which had a *cipher* as a symbol. The masses judged the new system by appearances and, consequently, thought of the zero as a numeral, that is, as a sign for a number. It appeared to them that the zero was used as a numeral was used; hence, zero must be a numeral and stand for *nothing*.

The zero is the characteristic feature of the Hindu-Arabic system because this system depends not merely on numerals to show quantity but also on the positions in which the numerals are written. In this system the size of the group is indicated by position, and the number of groups is indicated by the numeral written in that position. Each numeral thus serves the double purpose of showing a

[1] John W. Dickey, "Much Ado about Zero," *Elementary School Journal*, XXXII (November, 1931), 214.

number and of keeping the rest of the numerals written with it in their proper places; the 2 in 521 shows 2 tens and puts the 5 in the hundreds' place. Suppose a person has nothing to write. If that is the only purpose he has in mind, he writes nothing. There is no economy nor common sense in writing something—the zero—for nothing. Suppose, however, that a person has nothing to write in a given position and that he needs some means of keeping the numerals he must write in their proper places, for example, in writing five hundred and twenty. He has no units to write. Why write zero for nothing? There is no need to indicate nothing by a sign, but there is need to put the 2 and the 5 in their proper places. The zero in 520 serves that important and essential purpose. A person never needs the zero until he must write the quantity *ten* or certain quantities larger than *ten*. He then needs the zero to hold position. The zero is a place-holder.

It is interesting to note that the original terms for zero did not mean a group of none. Both the Hindu term *śūnya* and the Arabic term *ṣifr* meant empty or void. The sign, 0, was originally a sign for the empty column. It was left to the masses, who watched the use of the zero and who noticed only what their eyes could see, to convert the original and useful meaning of zero to *nothing*. A difference grew up between the arithmetical, or actual, use of the zero and the popular, or apparent, use of the zero. Teachers of elementary arithmetic might do well to take note of this difference.

Failure on the part of teachers of arithmetic to note the distinction between the actual use and the apparent use of the zero is responsible for the confusion children experience in employing the zero in computation. Children who are learning arithmetic must actually employ the zero for what it is intended and for what it is—a place-holder. They must so use the zero whether they realize the situation or not, since this use of the zero is part of the machinery of the system. They will, of course, be confused somewhat by appearances because the use of the zero looks like the use of the numerals. Let the teacher, however, fail to make the distinction or, what is worse, attempt to teach the apparent use of the zero as a symbol for *nothing* while neglecting entirely to call attention to the actual use of the symbol, and the confusion of the children will be worse confounded.

As a remedy, the teacher often turns to better, more complete and skilful methods of teaching the apparent use of the zero; and the teacher often finds himself in as much bewilderment about the failure of the improved methods of teaching the apparent uses as are the children in their attempts to convert apparent uses into actual uses.

In fairness to the good intentions of teachers, however, it must be admitted that the efforts to improve their methods of teaching the apparent uses of the zero are not without some measure of success. It often appears to teachers that the children must add, subtract, multiply, and divide zero just as they add, subtract, multiply, and divide when any of the nine numerals are used. Consequently, as a means of preparation, the "zero combinations" are "taught." There is much explaining, and many drills are given. Through persistent effort children finally learn to set down the approved answers when the zero is used. Since the actual use and meaning are, of necessity, neglected, what the children learn to do is barren of meaning. Their human minds are turned into machines for use in responding to the "zero combinations" by giving what the teacher says are the correct answers. Like machines, they learn to respond, but, also like machines, they fail to think and to understand. Moreover, since the actual positional use of the zero is neglected in teaching the apparent uses, the children who finally learn to respond with correct answers are not helped to keep the positions of their answers clear. If and when they learn about the importance of position, they learn it incidentally or as a separate and unrelated item.

However important for later mathematics the idea of the zero as a numeral or as a position on a scale or as a division point between positive and negative numbers may be, we shall, sooner or later, have to give attention to the fact that these are not the concepts of the zero needed in elementary arithmetic. However important for later mathematics the use of the zero in various combinations may be, we shall, sooner or later, have to become aware of the fact that there are in reality no "zero combinations" in early arithmetic. One may look into textbooks and find them there, or one may look into primary classrooms and find them there. They exist, however, only as signs which are written and which may be read. They do not exist in the mind of the beginner who is learning arithmetic.

If a child has three pennies in one pocket and none in any other, he knows perfectly well how many pennies he has. He can count the three pennies. He does not think of counting pennies in the other pockets. There are none to count. To make him write $\underline{3\atop 0}$ does not make him count pennies where none exist. The three pennies he has are undisturbed, and the child knows it. Writing the signs $\underline{3\atop 0}$ and hearing the question, "Three and none are how many?" may, however, distract him from the actuality that the three pennies are undisturbed. To write $\underline{3\atop -0}$ and to say, "None from three is three," are needless. If nothing happens to the three pennies, there is no object in treating the situation as though something has happened. If the child has three pockets but has no pennies, he is no more aware of the fact after he learns to write $\underline{\times 3\atop 0}$ and to say "Three nothings are nothing." When nothing is thought of as 0, it would appear that three nothings are three nothings. If the learned Greeks could not conceive of a symbol, which is something, for *nothing*, there is little wonder that the primary-grade child is confused when he is required to write and deal with something he can see and handle as *nothing*.

However, the teacher is convinced that the pupil will have to use the zero in combination when he begins to deal with numbers larger than nine. The actuality is quite different. Actually the pupil will have to deal with the zero only as a place-holder. In adding $\underline{30}$ a person actually adds the 2 tens and the 3 tens just as he adds 2 and 3. He must, however, write his answer in the tens' position. Writing the 0 at the outset will put the numeral 5 in its proper place. In adding $\underline{25\atop 30}$ a person actually adds the 5 and the 1 in the units' column. The zero is there merely to put the 3 in the 30 in its place. The zero does not stand for quantity, and it is neglected in the addition. In multiplying $\underline{\times 2}$ a person does not multiply *nothing* by 2. He must

multiply the 4 tens by 2. This he does, and he must set the answer down in its proper place. Recognizing this necessity, he first writes the 0 in order to put the 8 of the answer in its place. In dividing

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a person divides the 8 tens just as he would divide 8. He recognizes that the answer must take the same position as the 8 of the dividend. He writes it there. He does not now proceed to divide *nothing*. If there is nothing to divide, he does not divide. The 0 in the dividend puts the 8 in its place; the 4 of the quotient takes the same position; consequently the person concludes by writing 0 to put the 4 of the quotient where it belongs. Likewise, in all the operations the zero may be neglected in computation. Since it is not a numeral, to try to treat it as such is misleading. The zero holds position. Treated aright, it emphasizes position. Instead of trying to learn sixty-six meaningless "zero combinations," the child may learn to use the zero for the one, *and only one*, purpose of keeping position clear.

In conclusion, it may be urged that the zero is a part of the machinery of the Hindu-Arabic system of numerals and that its proper use is determined by the operation of that machinery. Its proper use in relation to the machinery to which it belongs may be compared to the proper use of the steering wheel as a part of an automobile. The steering wheel has an actual use which is determined by the machine to which it belongs. To the child the steering wheel may appear to be an amusing plaything. Shall we, then, spend our time devising more and more effective methods of teaching the child better and better uses of the steering wheel as a plaything? Shall we not rather try to divert his attention from the apparent uses of the wheel to its actual use?

The student of mathematics who occasionally looks into a textbook in arithmetic, or who visits an elementary classroom, or who turns to the literature which deals with the so-called "zero combinations" may wonder why there is so "much ado about nothing." Such a one needs to be informed that the "zero combinations" were invented by certain people who were more interested in appearances than in actualities.

Educational Writings

REVIEWS AND BOOK NOTES

Principles underlying instruction in reading.—The purpose of the author of a recent book[1] appears to be given in the last sentence of the fifth chapter: "Most published reading systems contain material for use, ... but most of them do not give the teacher sufficient insight into why she should do this or that and, therefore, do not help her to adapt or emphasize methods intelligently" (p. 119). Professor Dolch's volume, written to fill this need, is devoted chiefly to explanations or rationalizations of the principles underlying various practices in the teaching of reading. Since more attention is given to psychological than to pedagogical principles, the book is primarily an explanatory psychology of the reading processes and reading methods.

The author's plan may be illustrated by the argument of chapter ii, entitled "From Visual to Auditory." He states that, when the child first comes to school, his "language is sound" and "all language meaning is inseparably connected with sound images" (p. 25). This being the case, the "first stage in teaching reading . . . . [is to] enable [the child] to match auditory mental images to visual perceptual images" (p. 28). The second stage is a "'short circuiting' of this process" (p. 28). Assuming, as the author does, the validity of this theory, a number of practices in the teaching of reading are at once logically indicated. The teacher who accepts the theory should presumably see the "reasons why" various procedures are proper. She should also be able to select from other practices those which fit the theory.

Professor Dolch has thus undertaken one of the most difficult and risky treatments of reading. Professor Cattell once said to a group of his students, "I don't propose to quarrel with the facts of psychology, but I am confident I can reasonably disagree with anyone's explanation of them—even my own." For the reason here suggested, Professor Dolch's volume is a happy find for the reviewer disposed to exercise his talent for disagreeing. Ventures into explanation of facts in terms of principles are, however, as important as they are difficult. In so far as they are, on the whole, reasonable, they are valuable and hence to be encouraged rather than discouraged. While the reviewer found, here and there

[1] Edward William Dolch, *The Psychology and Teaching of Reading.* Boston: Ginn & Co., 1931. Pp. vi+262. $1.80.

in Dolch's book, points to quibble over, he felt, on the whole, that the account was constructively illuminating. He therefore recommends it to other readers.

The book begins with an analysis of motives in a chapter entitled "Getting Eagerness To Read." The story motive, the play motive, the mastery motive, and the utility motive are justified, and the "please-the-teacher" motive is deplored. The next four chapters deal with the fundamentals of beginning methods. The author concludes that "(1) memorizing content, (2) noting appearances of words, and (3) sounding of words must enter into any sound psychological system" (p. 118). While the reviewer elects to cast his ballot against the first of these candidates, he found the practical suggestions in Part I well selected and rationalized.

Part II, which is entitled "The Developed Reading Process," contains good treatments of eye-movements, perceptual processes, oral- and silent-reading habits, study techniques, skills in independent reading, methods of testing reading abilities, and methods of diagnosing special deficiencies. These accounts are given in intelligible though brief form. The reader is assisted by topical headings and chapter summaries. In keeping with his purpose of explaining the reading processes and indicating teaching methods, the author refrains from including detailed lesson plans, sample reading materials, exercises, questions, tests, and other concrete materials. He does not attempt to present either a systematic or a complete summary of experimental studies, although he utilizes experimental data when they serve his primary purpose. As a consequence, the argument moves rapidly without interruption, and the many issues are covered in a relatively brief account. An appendix enables the reader to select representative books for further reading on any topic.

ARTHUR I. GATES

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Studies of spelling problems.—Research in any field improves as we sharpen the tools of criticism and technique. Critical evaluation of the contributions of others and familiarity with methods of objective investigation are essential for scientific advance in spelling as elsewhere. The quality of the research in spelling has perceptibly improved in recent years as a result, perhaps, of better grounding in these fundamentals.

William Henry Coleman[1] has made a study that is of special importance as a critical document. He has keenly analyzed spelling objectives and principles of curriculum construction, spelling lists, and spelling books with a view to determining proper methods of selecting and grading the minimum spelling vocabulary. In his own words, it is the purpose of his study "to evaluate, by means of analysis, the validity of the method used and the reliability of the results ob-

[1] William Henry Coleman, *A Critique of Spelling Vocabulary Investigation.* Colorado State Teachers College Education Series, No. 12. Greeley, Colorado: Colorado State Teachers College, 1931. Pp. x+120. $2.00.

tained by those who have engaged in scientific study to determine spelling curriculums" (p. 1). Coleman's monograph performs a job of integration. It helps one to survey the field of vocabulary investigation, observe the congruent and conflicting trends, and reach a conclusion regarding the nature of an acceptable outcome. His work is as important for his shrewd insight as for the new objective data that he presents.

The author is nothing if not practical. His work eventuates in a spelling list of 3,017 words for use in the public schools. This list is composed of the words found in at least fifteen of thirty-three lists examined. The source lists represent spelling investigations and textbooks; primary- and secondary-school lists; writing, speaking, and reading vocabularies of children; and writing and reading vocabularies of adults. One observes that the selected list does not comply with the principles of derivation arrived at as a result of Coleman's investigation, for its basis is not limited to the writing of children and adults and emphasis is not placed on the writing of children, the course advocated in his earlier discussion. In answer to this criticism, the author would probably suggest that data are not yet available for the construction of a vocabulary in accordance with his "ideal" plan. It is the opinion of the reviewer, however, that even at present the spelling vocabulary should be derived from original writing vocabularies, not from spelling textbooks nor from reading vocabularies.

The remaining publications referred to in this review deal with problems in the method of teaching spelling.

Claire Turner Zyve[1] made an attempt to discover experimentally the relative effectiveness of directed study versus individual study, lists only versus the list-context method, home-work review versus its omission, and blackboard versus lantern presentation of words. Half the monograph is devoted to previous investigations relating to these problems. The instruction on which the results were based was given by twelve teachers in a public school and was continued during a period of two years. The program of work for the teachers seems to have been carefully organized, and the report of results, though brief, is definite and clear.

To illustrate the findings, one may take the results pertaining to individual study versus directed study, a problem of much importance to the many teachers who are now using the pretest method. The problem is this: After the pretest has revealed the words that need to be learned, is it better for the teacher and children working together to devote a uniform amount of class time to each word missed by any pupil, or is it better for each pupil to study individually only the words which he himself missed, in accordance with a study procedure which he has been taught? The average gains by the two methods differed to the extent of two words in a total assignment of eighty words, of which, on the average, twenty-eight were missed. The author has computed the standard deviation of

[1] Claire Turner Zyve, *An Experimental Study of Spelling Methods*. Teachers College Contributions to Education, No. 466. New York: Teachers College, Columbia University, 1931. Pp. vi+86. $1.50.

this difference and finds it to be 1.24. She explains that "the sigma of the difference should be at least three times the difference to insure practical certainty that the true difference will be greater than zero" (p. 51). Of course, she does not mean what she says but rather that the difference should be at least three times its sigma. The difference in gains is, in fact, 1.6 times its sigma, and this result implies that we are not certain of a difference between the two methods. The chances, however, are about twenty to one that there is *some* difference in favor of teacher-directed study, evidently small, perfect control of conditions in the experiment being assumed.

There was a time when leading professors of education were interested in nothing more than methods of teaching. Today many of them are interested in nothing less. The change of attitude is due in part to a growing skepticism regarding the possibilities of the experimental technique in situations as complex as those found in many problems of instructional method.

Now we come to an adventure in so-called "creative education."[1] No disrespect is implied in this statement but simply admiration for a vocabulary. The history of advertising seems to show that there is something in a name, even when other brands are just as good.

The authors present their book as "A Manual of Instruction" for those who desire to embark on the project method in the teaching of spelling. They sketch the theory of this method and show how it was applied in the public schools in Hamtramck, Michigan. The details of their procedure are clearly presented. No attempt was made to measure its effectiveness in comparison with the effectiveness of better-established methods.

It is admittedly difficult to teach the skill subjects by the project method. Before it is possible to do so, one is informed, the fundamental aim of instruction must be revised. From the new point of view, "it is not the achievement that counts, but the growth of which achievement is the symptom" (p. 7). Growth is defined as "increased consciousness of one's self as a person growing in power, desiring to grow, rejoicing in growth" (p. 7). Consciousness . . . . self . . . . person . . . . power. What a series of topics for a psychological discussion! Here none of them stands for anything but a manner of speaking. When, however, one turns to Section V on "Tests and Standards" (presumably written by Courtis), one finds a graph of an educational growth curve and notes that it is based on the percentages of correct spellings of the word "gang" in the different grades. Here growth in spelling is evidently conceived as improvement in spelling achievement.

The manner in which the project method is applied to spelling is well illustrated in handling the study problem. The children are asked, "Have you an effective and systematic method of study?" The teacher is requested to write the children's contributions on the board and add others of her own. The final

[1] Helen Miller, S. A. Courtis, and Garnette Watters, *Creative Teaching in the Field of Spelling:* A Manual of Instruction. Des Moines, Iowa: Wallace Publishing Co., 1931. Pp. x+134.

list of suggestions, we are told, "ought to be somewhat as follows," whereupon a list of study steps is presented that reflect quite adequately the results of scientific investigations. The reader will be reminded of the first-grade teacher whose curriculum calls for a farm project and who directs the pupils so that they seem to have invented the idea. The characteristic feature of the method, as of the project method in general, is the emphasis on pupil purposing. Even if the project method fails to measure up to the expectations of its proponents, it should contribute something to the motivation of study in the public schools. Much attention is given in the report to the learning of spelling by the method of transfer.

The next report[1] deals objectively with this problem. Sartorius compiled a list of 4,065 words from adult vocabularies and seven widely-used spellers. These words were graded by means of difficulty data obtained in investigations and their grade position in the spelling books. The different combinations of letters in the words of each grade were then determined by comparison with a table containing all the possible two-letter combinations among the twenty-six letters of the alphabet. One of the conclusions runs as follows: "Of the twenty-two word elements having a frequency of over two hundred, only one has as few as two pronunciations. The most frequent digraph, *in*, can be pronounced in seven ways" (p. 26).

This analysis provides the best picture available of the facts that are to be dealt with in the "phonetic" grouping of words. It shows the difficulties that must be faced in this type of rationalization, but it does not disprove the possibility of transfer when words containing elements both visually and phonetically identical are taught together. Experiments still favor this procedure.

Sartorius also made an analysis of rules used in the teaching of spelling. In twenty spellers 110 different rules were found, thirty-eight of which appeared in five or more of the books. Of the thirty-eight, there were fourteen rules to which there were no exceptions in the vocabulary of 4,065 words. A tabulation shows that these fourteen rules apply to the spelling of only 202 of the 4,065 words. As regards the efficacy of rules, one naturally raises the question whether it would be more economical to use the fourteen rules in learning to spell the 202 words or to master these words without regard to rules. The reader, perhaps, need not be informed that experiments dealing with the value of rules in spelling have, in general, yielded negative results.

FREDERICK S. BREED

Preparation of teachers in using curriculum materials.—Changing social and economic conditions, together with changing points of view in the philosophy and psychology of education, have affected markedly and in diverse ways the elementary-school curriculum. Perplexing problems confront the teacher in

[1] Ina Craig Sartorius, *Generalization in Spelling:* A Study of Various Bases of Generalization in Teaching Spelling. Teachers College Contributions to Education, No. 472. New York: Teachers College, Columbia University, 1931. Pp. viii+66. $1.50.

service who would use curriculum materials wisely. The same problems reach back to those responsible for the training program of prospective elementary-school teachers. Of distinct value to teachers in service, supervisors, and especially teacher-training faculties is a publication[1] reporting a study made to "determine those experiences and materials which should be included in the training program of the elementary teacher-to-be to the end that he may use the possible materials of instruction in an increasingly effective manner" (p. 3). The monograph is divided into two parts. Part I reports an investigation to determine what are the present practices and what the desired activities of teachers in using curriculum materials. Part II presents an interpretation of these practices and activities in the light of educational principles. The whole study is a detailed, searching analysis of effective use of instructional materials.

The check-list technique was used to secure the data on present and desired practices. A comprehensive check list of eighty-five activities, secured from analyses of professional literature, classroom observation, representative courses of study, and collections of teachers' activities, was submitted to elementary-school teachers, supervisory and administrative officers, staff members of teachers' colleges, and specialists in teachers' training. Their evaluation was made in terms of three criteria: (1) importance and desirability of performing the activity, (2) difficulty of performance, and (3) effect of training on performance ability. It was recognized that a person's basic point of view of the major function of education would influence both present and desired practice. Accordingly, provision was made in the check list for the identification of reactions of different schools of educational philosophy.

The data secured are open to the criticisms applying to the check-list technique, particularly when the demands made by the items on the list are as rigorous as were those of the study under review. Evidence of this fact appears in the failure of teachers holding distinctly different points of view as to the major function of education to differentiate themselves either as to actual or desired practice. However, one can agree with the investigator that the data point to the following conclusions: (1) Although there is now much confusion in both present and desired practice in the use of curriculum materials, there are certain activities which may well constitute the core of effective practice and on which there is reasonable agreement. (2) Further analysis is essential to provide criteria for the selection and differentiation of activities in terms of the various goals. Probably the most significant conclusion drawn from the data emphasizes the need for a functional program in the training of teachers "which will recognize the present diversity of practice and provide for growth in the ability to envisage the present situation in terms of the desired goals to be achieved" (p. 159).

[1] Florence Stratemeyer, *The Effective Use of Curriculum Materials:* A Study of Units Relating to "The Curriculum" To Be Included in the Professional Preparation of Elementary Teachers. Teachers College Contributions to Education, No. 460. New York: Teachers College, Columbia University, 1931. Pp. 162. $1.75.

The real contribution of the monograph lies in the analysis of teacher activities in the light of educational principles and in the preparation of suggested units of instruction in effective use of materials. There are those who object to the "job-analysis" method of training teachers. This objection loses much of its force when job analysis is merely the initial step, which is followed by analysis of the selected activities in the light of accepted principles, and when both analyses result in instructional units which develop essential understandings and meanings rather than mere skill in the use of teaching devices. The author has done an admirable piece of work in the statement of principles and the interpretation of these principles through teacher activities. More and more those who are responsible for the training of teachers are scrutinizing their curriculums and methods, deploring the gap which undeniably exists between educational theory and practice. In the instructional units as planned in this study is found a functional application of the educational principles recognized by the author. Training in the use of curriculum materials is put on an activity basis. Each unit consists of (1) the essential meanings and understandings to be developed in the training program, (2) the activities to be carried forward by the student through which the meanings and understandings are to be effectively developed, and (3) a selected bibliography for the unit. Those who wish to train teachers in a way that will make educational theory actually function in the teachers' later work will read Part II of the monograph with much interest.

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The effect of practice on individual differences.—The third volume of Thorndike's *Educational Psychology*, published in 1914, states: "Equalizing practice seems to increase differences. The superior man seems to have got his present superiority by his own nature rather than by superior advantages of the past, since, during a period of equal advantages for all, he increases his lead" (p. 305). Thorndike goes on to say, however, that the experiments on which this statement is based were too limited in scope to warrant a general application of their results. Starch, in the 1919 edition of his *Educational Psychology*, states that all experimental results point in the direction that practice does not equalize abilities. "In fact, equal practice tends to increase differences in achievement and skill rather than to decrease them. The more gifted individuals profit more, both relatively and absolutely, than the less gifted. This experimental fact is one of the most profound bits of evidence regarding the whole problem of heredity and environment" (p. 91). This statement remains unchanged in the 1927 edition of Starch's book, notwithstanding the fact that the writer of the monograph now under review had in 1924 shown that such an interpretation of the experimental facts is highly questionable, if not entirely erroneous.

It is regrettable that many questionable conclusions from experimental data easily pass as established truths and become dogmatic beliefs. The monograph

under review[1] extends the earlier work of the same author in which he criticized the methods usually employed in making measurements of the effects of practice on individual differences and showed that the conclusion that practice increases individual differences is probably false. In the present monograph Professor Reed summarizes the experimental work bearing on the problem and makes a critical analysis both of the experimental conditions and of the methods of measurement used. He concludes that the contradictions in the conclusions of experimenters have been chiefly results of variations in the methods of measurement. When choice is made of the best methods amongst the various possible methods, most of the ambiguity of results disappears and the general conclusion is reached that equal amounts of practice tend to reduce differences in abilities.

In addition to the summary of previous work the author presents new data from two experimental investigations of the effect of practice, the one in a motor test and the other in achievement in school subjects. The data show that "inequality in achievement in school subjects and in motor skill is reduced by giving pupils and students an equal opportunity to learn. If this is desirable, it justifies the gospel of equal opportunity as a policy in public education. It also appears that heredity has been overemphasized as a factor in explaining individual differences in achievement" (p. 57).

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Extra-curriculum activities in the elementary school.—Comparatively little of the large amount of literature dealing with extra-curriculum activities that has appeared in recent years has been concerned with the elementary school. That there is ample opportunity for such work in the lower schools and that auspicious beginnings have been made in a considerable number of the better institutions is shown conclusively in two pocket-sized books by F. C. Borgeson.[2]

The first volume treats the organizations in which the school as a whole is generally involved, such as home rooms, councils, campaigns, and assemblies. The second volume is concerned with the work of certain organizations which pursue comparatively limited interests, such as clubs, publications, and athletics. Volume I includes two introductory chapters, one on definition and values and another on present practice and theory, as well as a final chapter on character growth through school-life activities. The ideas presented in these chapters apply equally to both volumes.

Reports of activities by teachers and principals in service, the returns to a

[1] Homer B. Reed, *The Influence of Training on Changes in Variability in Achievement.* Psychological Monographs, Vol. XLI, No. 2. Princeton, New Jersey: Psychological Review Co., 1931. Pp. 60.

[2] F. C. Borgeson, *Elementary School Life Activities:* Vol. I, All-School Activities (A Statement of Current Practice), pp. xiv+144, $1.00; Vol. II, Group-Interest Activities (A Statement of Current Practice), pp. xiv+136, $1.00. New York: A. S. Barnes & Co., Inc., 1931.

question blank made by a large number of schools, and the available literature were utilized in the preparation of the books. Descriptions of the activities of superior schools make up a large part of the content. At the end of each chapter an annotated bibliography is given. Neither volume has an index. The two volumes taken together cover the field reasonably well. They will meet a need for effective assistance long felt by elementary-school teachers and principals.

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A science textbook for the upper grades.—The author of a textbook in science for the junior high school[1] believes, in common with many others who are interested in general-science textbooks, that such books are likely to be so large as to appear formidable and at the same time too small for adequate treatment of the topics included. Consequently, this author has made his material into four volumes, of which the book under review is the second. The series as a whole is called "Living in a World of Science" and is designed to provide material for a two-year course in general science. The first book of the series deals with water and air; the second, as the title indicates, with heat and health; the third, with magnetism and electricity; and the fourth, with energy and power. The author's plan, as explained in the Preface, is to emphasize, in the first half of the series, basic life-needs and, in the second half, the part which science plays in making life more comfortable, more convenient, and more interesting.

The second book contains sixteen chapters, each dealing with some phase of the larger topics of heat and health. Each chapter is expected to furnish work for approximately one week.

The chapters are practically uniform in length. They are also uniform in plan. At the beginning of each there is an "approach" intended chiefly to arouse interest. The main content of the chapter is then presented in a series of "steps." Demonstration experiments are to be carried on in connection with the reading of this material. A test entitled "How Much Do I Remember?" follows the "steps." Provision for individual differences in the matter of interest as well as in rate of achievement is made by suggestions for supplementary work under the headings "Things To Read About and Think About" and "Things To Do and Make." A page of problem pictures at the conclusion of the chapter serves to raise questions, suggest experiments, and furnish puzzles to be solved.

One sentence in the Introduction addressed to the pupil makes an initial bad impression on a critical reader of the book. In speaking of the test in each chapter, the author says, "Mark yourself on this test and do not be satisfied with less than 90 per cent" (p. xvii). If the items of which they are made up are worth including at all in short-answer tests of the type used in this book, anything less than a perfect score as a standard is absurd.

[1] Morris Meister, *Heat and Health.* New York: Charles Scribner's Sons, 1931. Pp. xviii+238. $1.08.

An examination of the tests themselves shows that they are of various kinds. In many instances emphasis is put on memory rather than on understanding. Some of the items included test merely the memory of insignificant details. Some of the tests, on the other hand, are as satisfactory as short-answer tests of the types used are likely to be. Certain of the types used are poor. Especially poor is the code type used at the conclusion of three chapters. Such tests require an amount of time out of proportion to their importance.

Certain of the approaches are well-written accounts, which serve well to introduce the topics under discussion. The account of a railway wreck, for example, is an interesting approach to the study of the effects of changes in temperature on volume. Many of the approaches, however, are poorly written. In the introduction to the first chapter, to illustrate, hypothesis and well-established fact are mixed together with nothing to distinguish one from the other. Moreover, a marked tendency to "write down" to children in an undesirable fashion is evidenced in some of the approaches. Some, for example, are cast into the form of dialogues.

There is much good and simply-written material in the many "steps." There are, however, evidences of carelessness in checking for accuracy in some places. Moreover, the tendency to "write down" is carried in certain chapters into the body of the book. The entire body of material about the uses of fire, for example, is given in the form of talks which the children of a class are supposed to have given as an assembly exercise.

The illustrations range from poor to good. The suggestions for individual work are very helpful.

A consideration of the book as a whole leads one to question strongly the advisability of dividing the subject matter into chapters of almost uniform length. Why, for example, should the material about fire be presented in several chapters instead of in one longer chapter? How can the fact that approximately the same amount of space is given to thermometers as is given to "The Fight of a City for Health" be justified? Certainly such an organization makes for monotony and lack of accent.

To summarize, in spite of its good features, the defects of the book are such as to limit definitely its usefulness as a basic science textbook.

BERTHA M. PARKER

CURRENT PUBLICATIONS RECEIVED

GENERAL EDUCATIONAL METHOD, HISTORY, THEORY AND PRACTICE

Annotated List of Graduate Theses and Dissertations, The Department of Education, The University of Chicago, 1900–1931. Chicago: Department of Education, University of Chicago, 1932. Pp. iv+120. $0.50.

CONNOR, RUTH. *The Scholastic Behavior of a Selected Group of Undergraduate Home Economics Students.* Teachers College Contributions to Education,

No. 497. New York: Teachers College, Columbia University, 1931. Pp. x+72. $1.50.

COX, PHILIP W. L., and LONG, FORREST E. *Principles of Secondary Education.* Boston: D. C. Heath & Co., 1932. Pp. viii+620. $2.40.

French Liberalism and Education in the Eighteenth Century: The Writings of La Chalotais, Turgot, Diderot, and Condorcet on National Education. Translated and edited by F. de la Fontainerie. New York: McGraw-Hill Book Co., Inc., 1932. Pp. x+386. $2.25.

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HAYNES, BENJAMIN R., and GRAHAM, JESSIE. *Research in Business Education* Los Angeles, California: C. C. Crawford (University of Southern California), 1932. Pp. 232. $2.00.

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